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CONDUCTED BY

H. H. STATHAM,

FELLOW OF THE ROYAL INSTITUTE OF BRITISH ARCHITECTS.



"EVERY man's proper mansion-house, and home, being the theater of his hospitality, the seat of self-fruit, the comfortablest part of his own life, the noblest of his sonne's inheritance, a kind of private principdome, may, to the possessors thereof, an epitome of the whole world, may well deserve, by these attributes, according to the degree of the master, to be decently and delightfully adorned." \* \* \* \* \*

"Architecture can want no commendation, where there are noble men, or noble mindes."—SIR HENRY WOTTON. \* \* \* \* \*

"OUR English word To BUILD is the Anglo-Saxon Būlsan, to confirm, to establish, to make firm and sure and fast, to consolidate, to strengthen; and is applicable to all other things as well as to dwelling-places."—DIVERSIONS OF PURLEY.

"ALWAYS be ready to speak your mind, and a base man will avoid you."—WILLIAM BLAKE. \* \* \* \* \*

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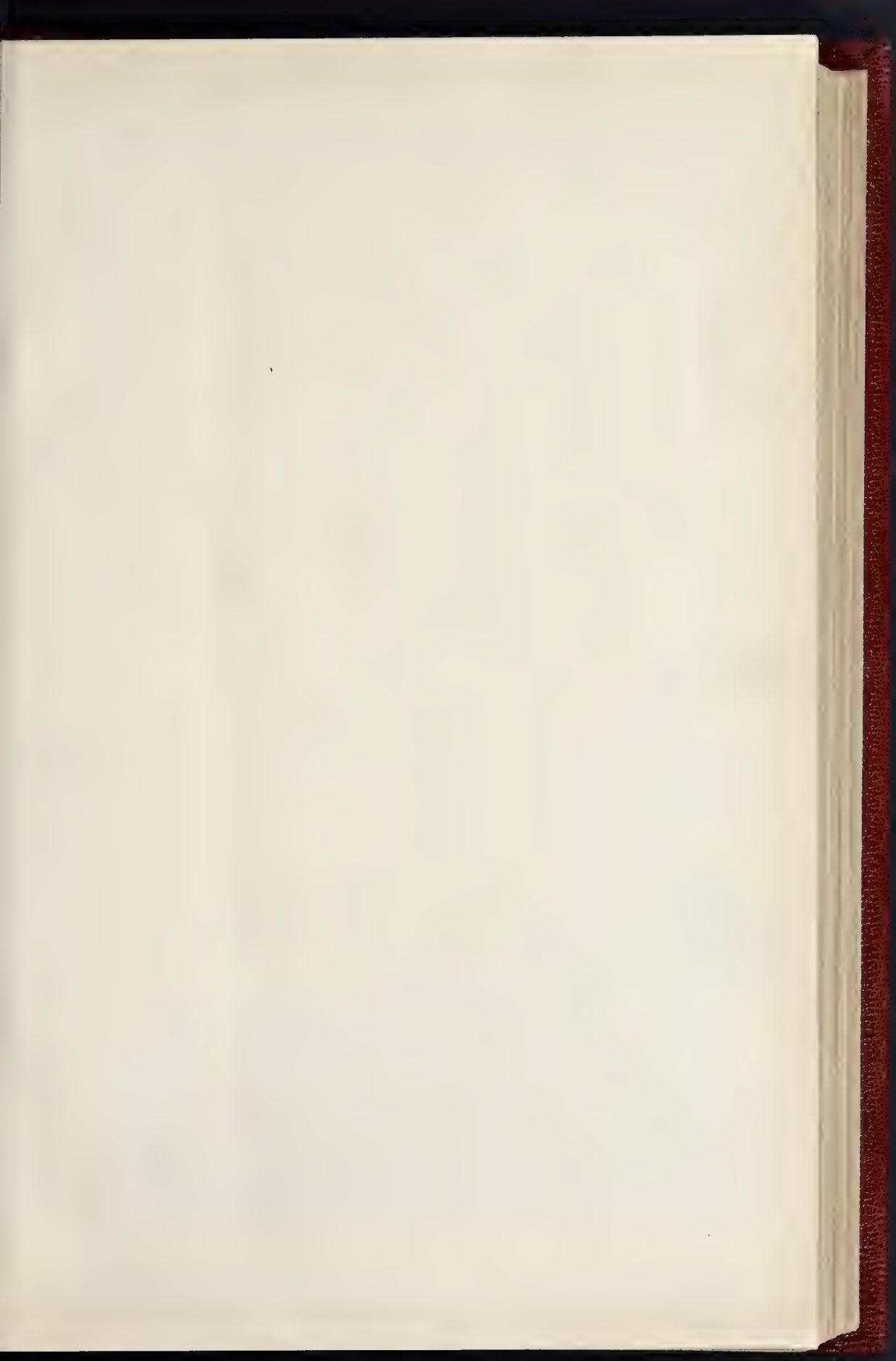
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THE MUSÉE GALLIÈRA, P



JARY 6, 1894



M. LÉON GINAIN, ARCHITECT.











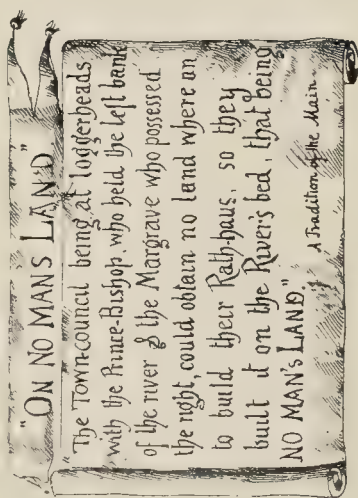






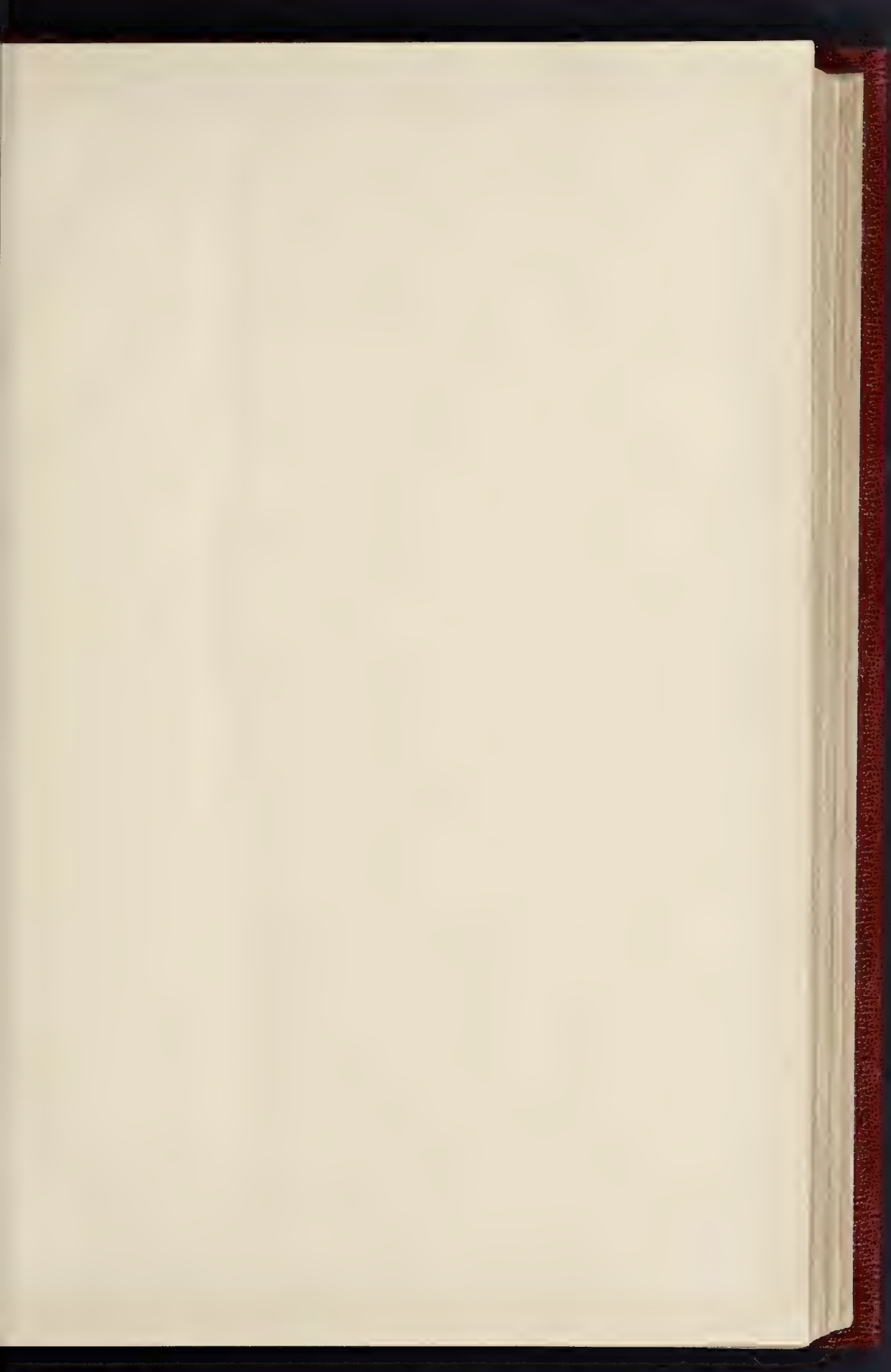
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THE ABBEYS OF GREAT BRITAIN.—No.

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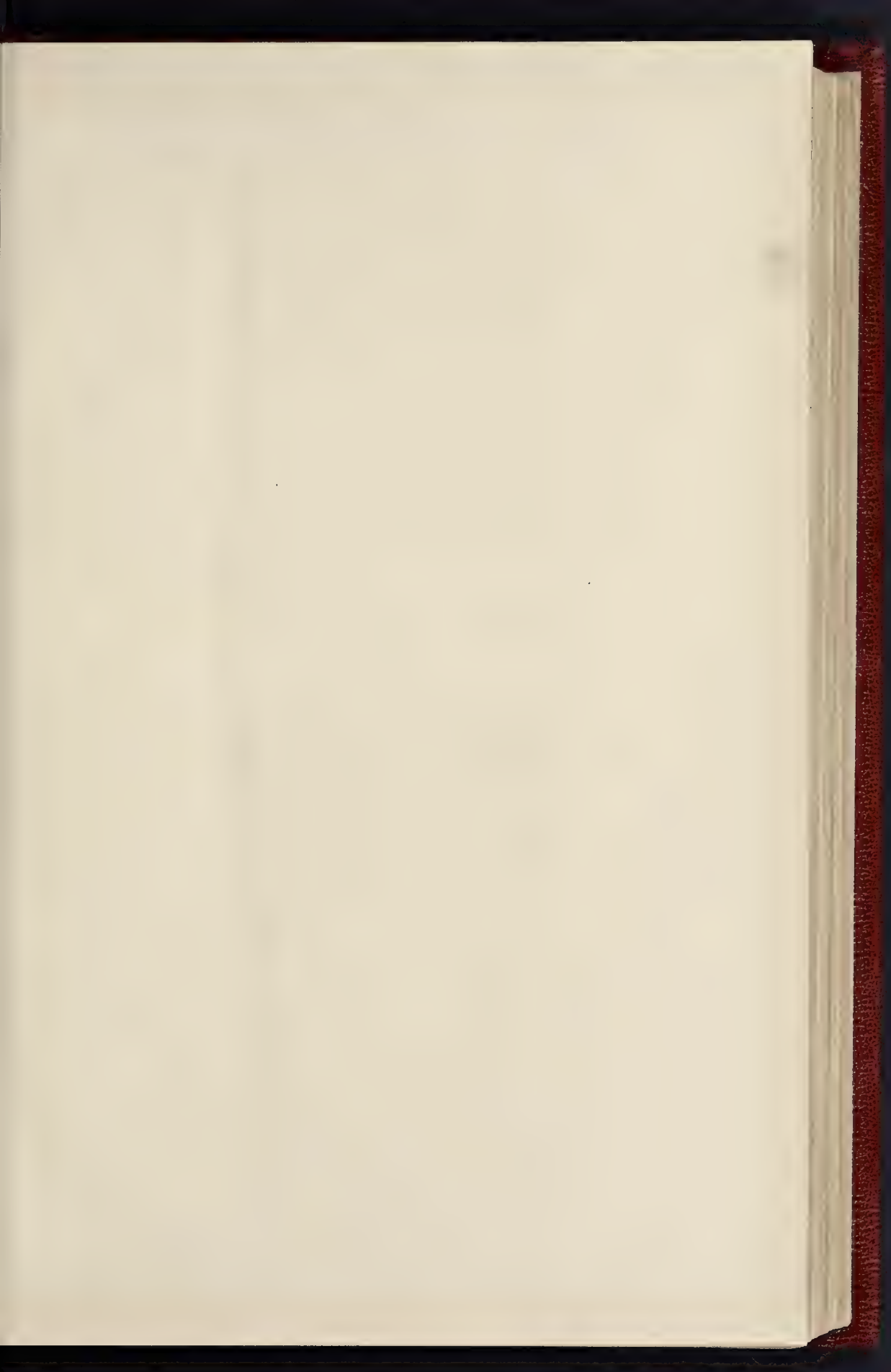


WESTMINSTER: FROM THE NORTH-EAST.

EGG ARIBA



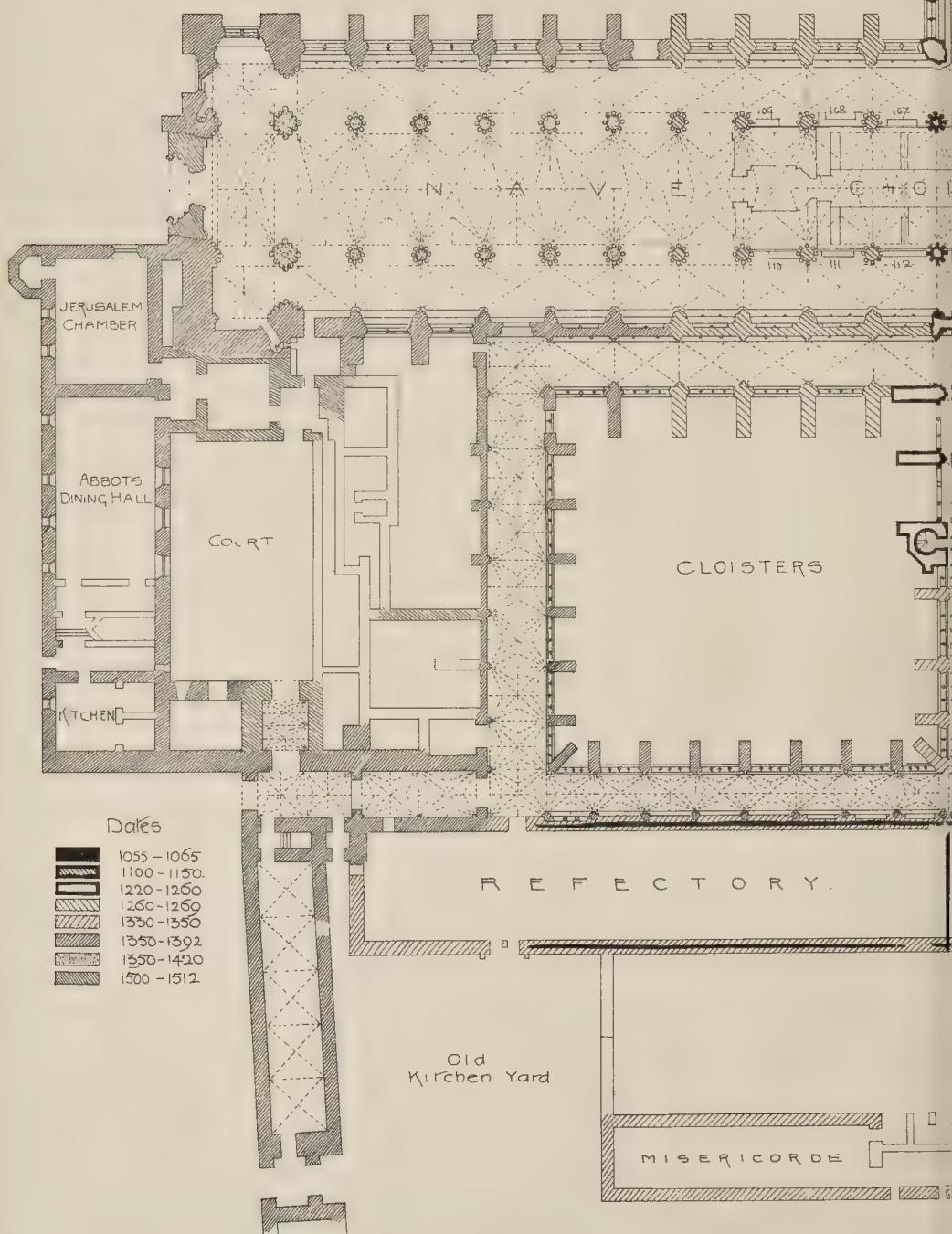




# THE ABBEY OF SAINT PETER, WESTMINSTER. Ground Plan

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Scale

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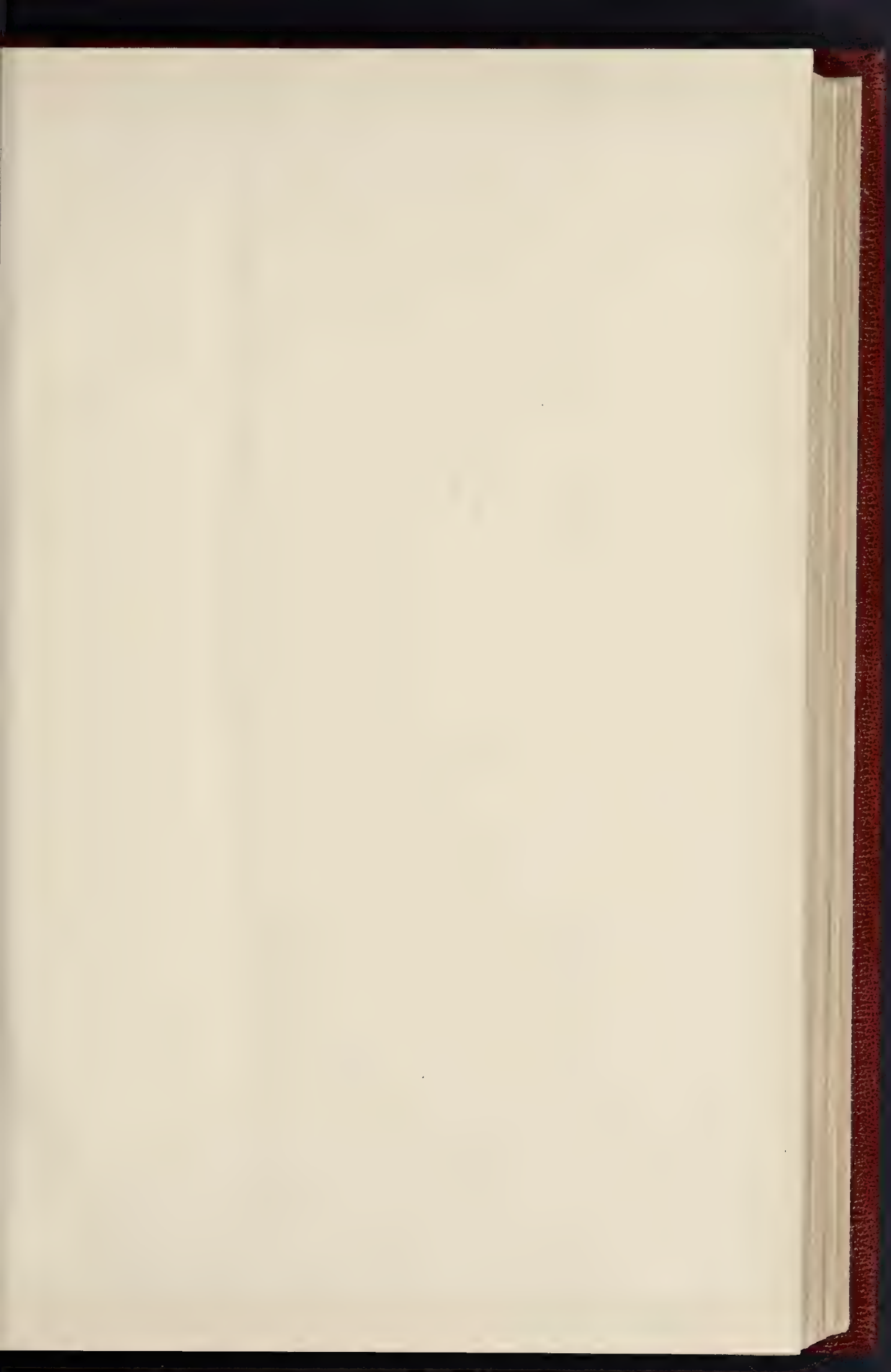














THE ANCIENT CATHEDRALS OF SCOTLAND.

No. 7. DUNKELD.





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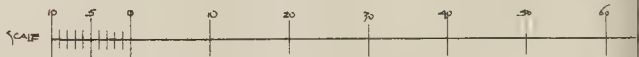
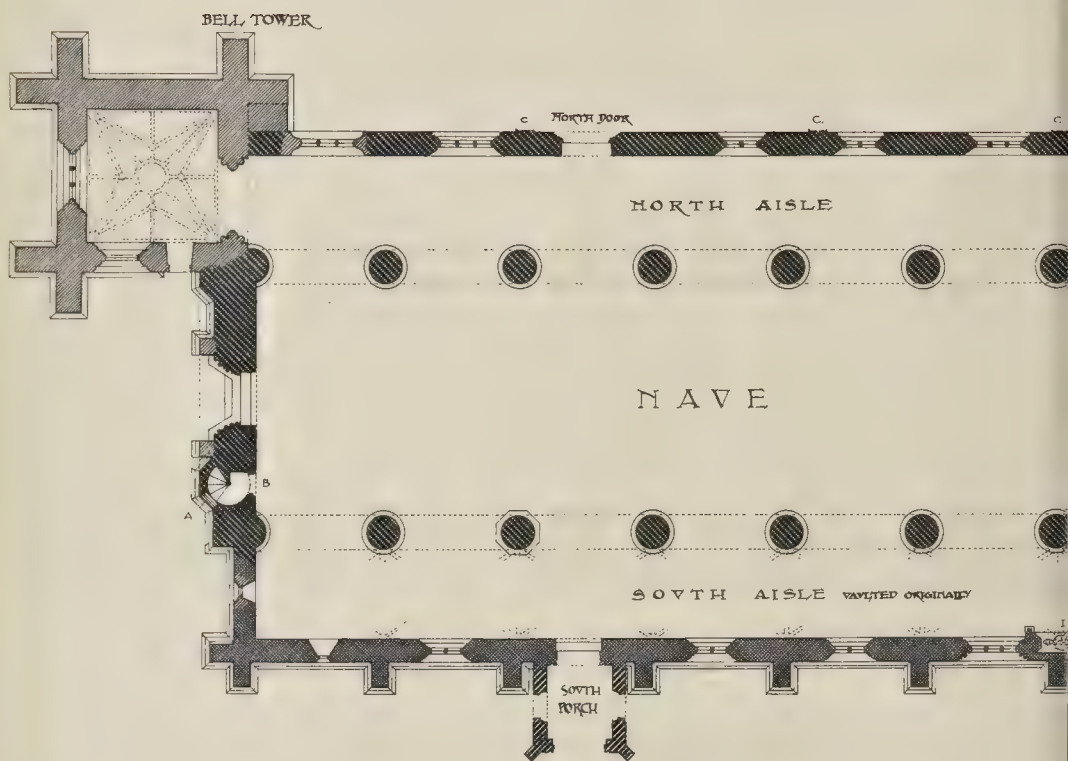
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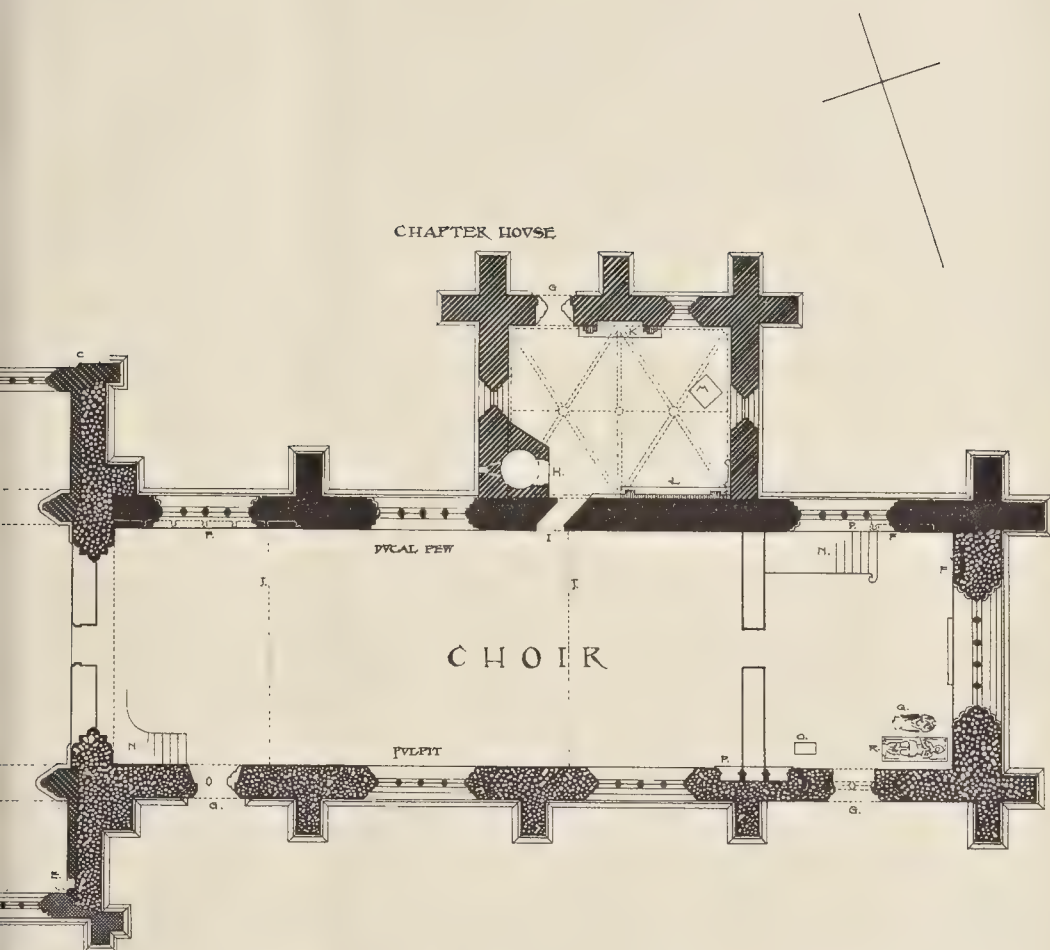


## DUNKELD CATHEDRAL



ALEXANDER M. GIBSON  
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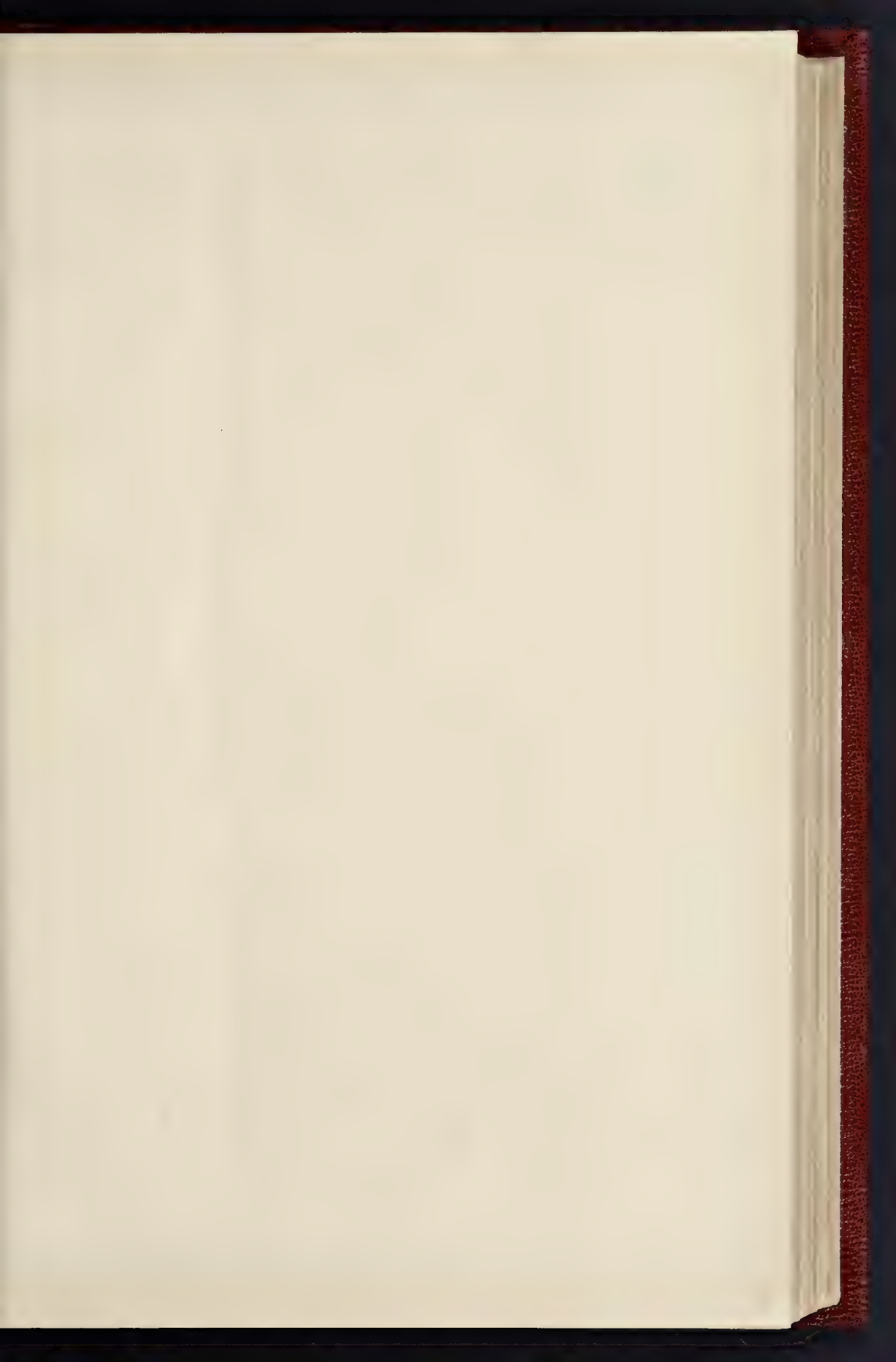
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- A. BOOK BUILDUP
- B. SOUTH TOWER STAIR
- C. WALLS, BROKEN AWAY
- D. TOMBS, BISHOP DE GURNEY 1407-36
- E. PLACIA
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- O. MODERN, CELTIC CROSS
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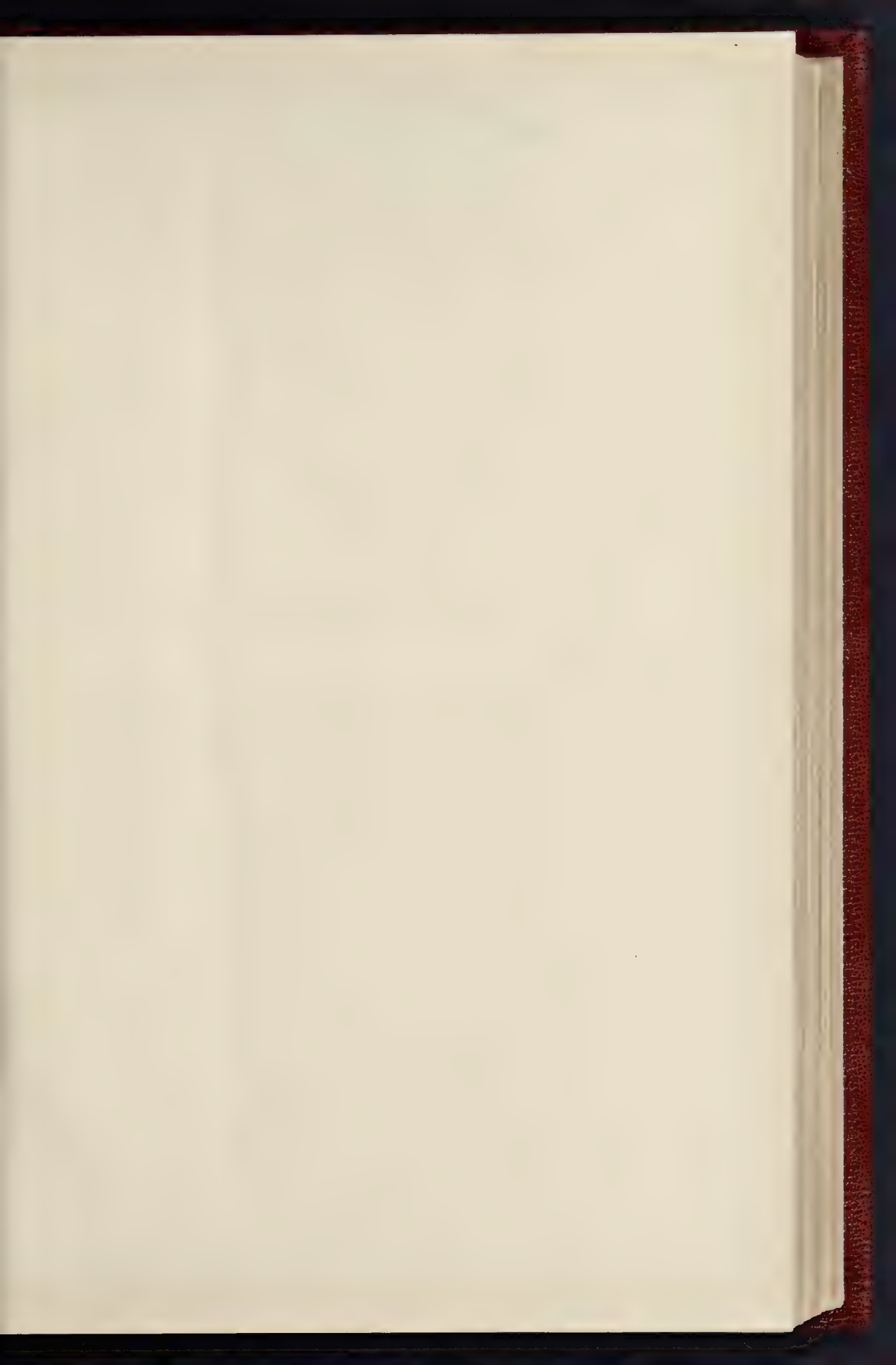


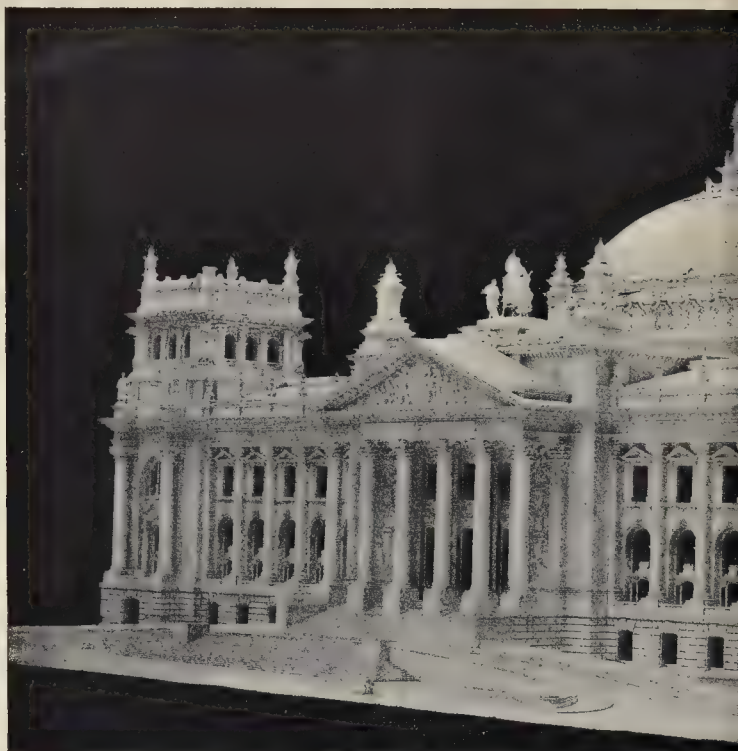


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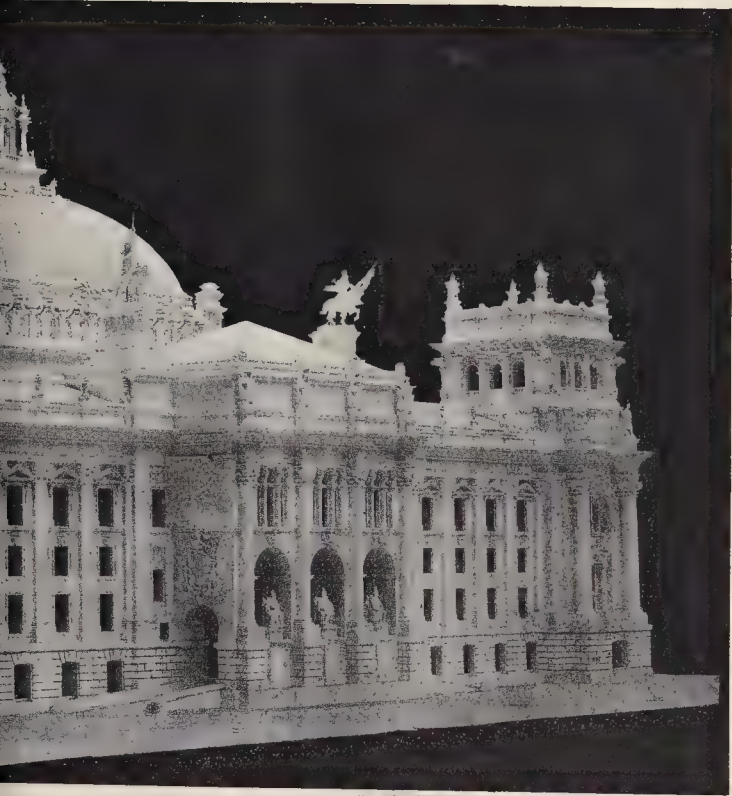
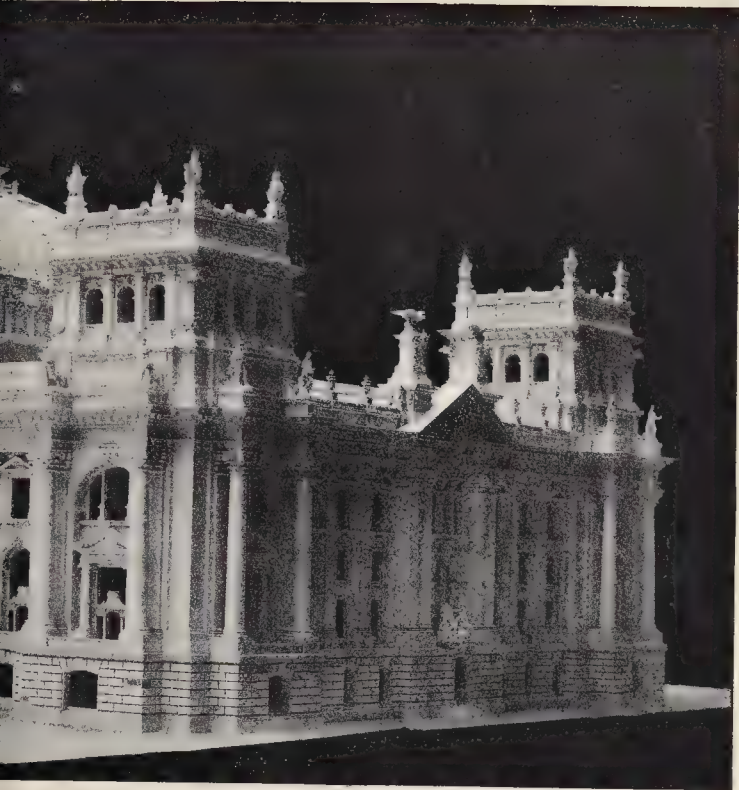
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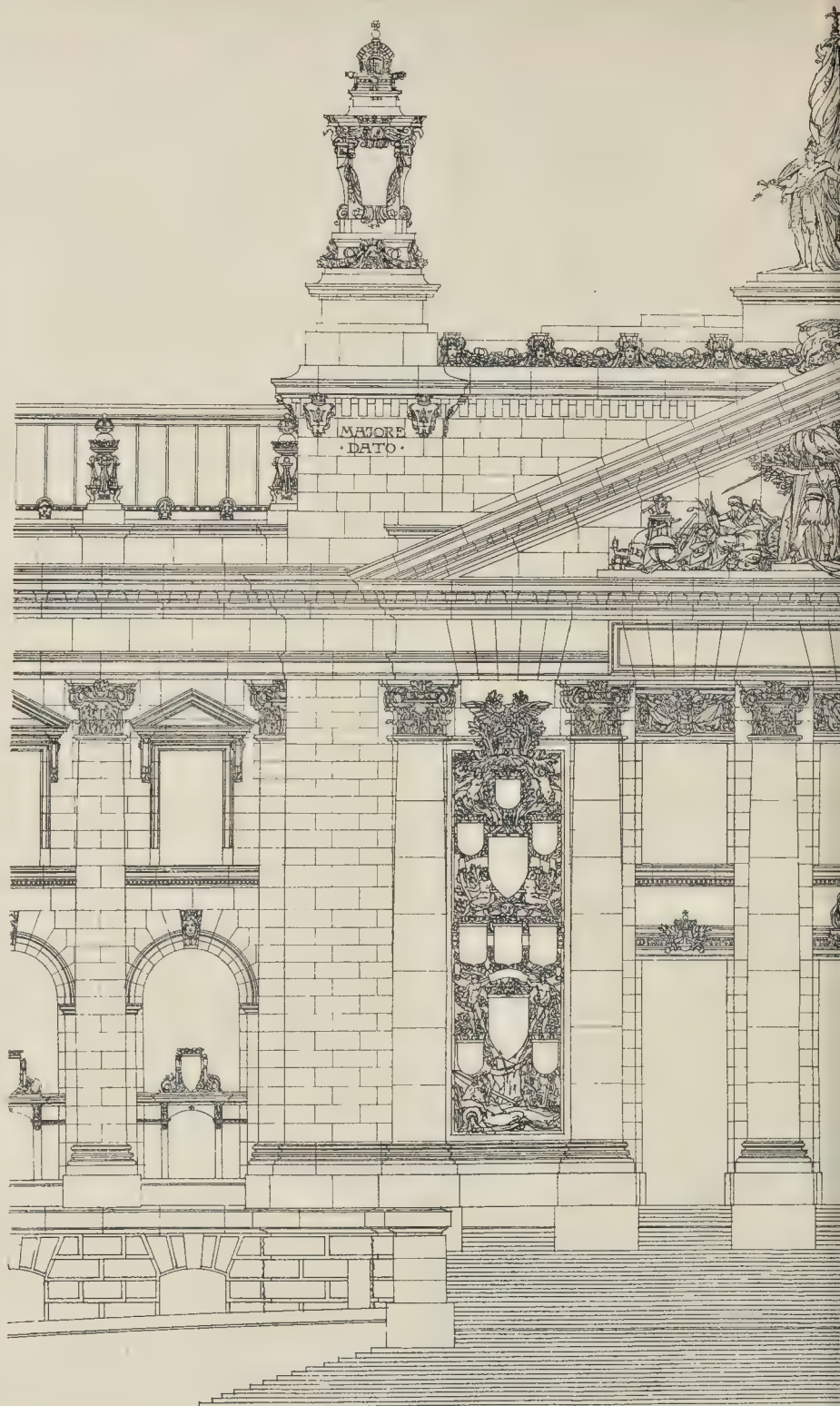


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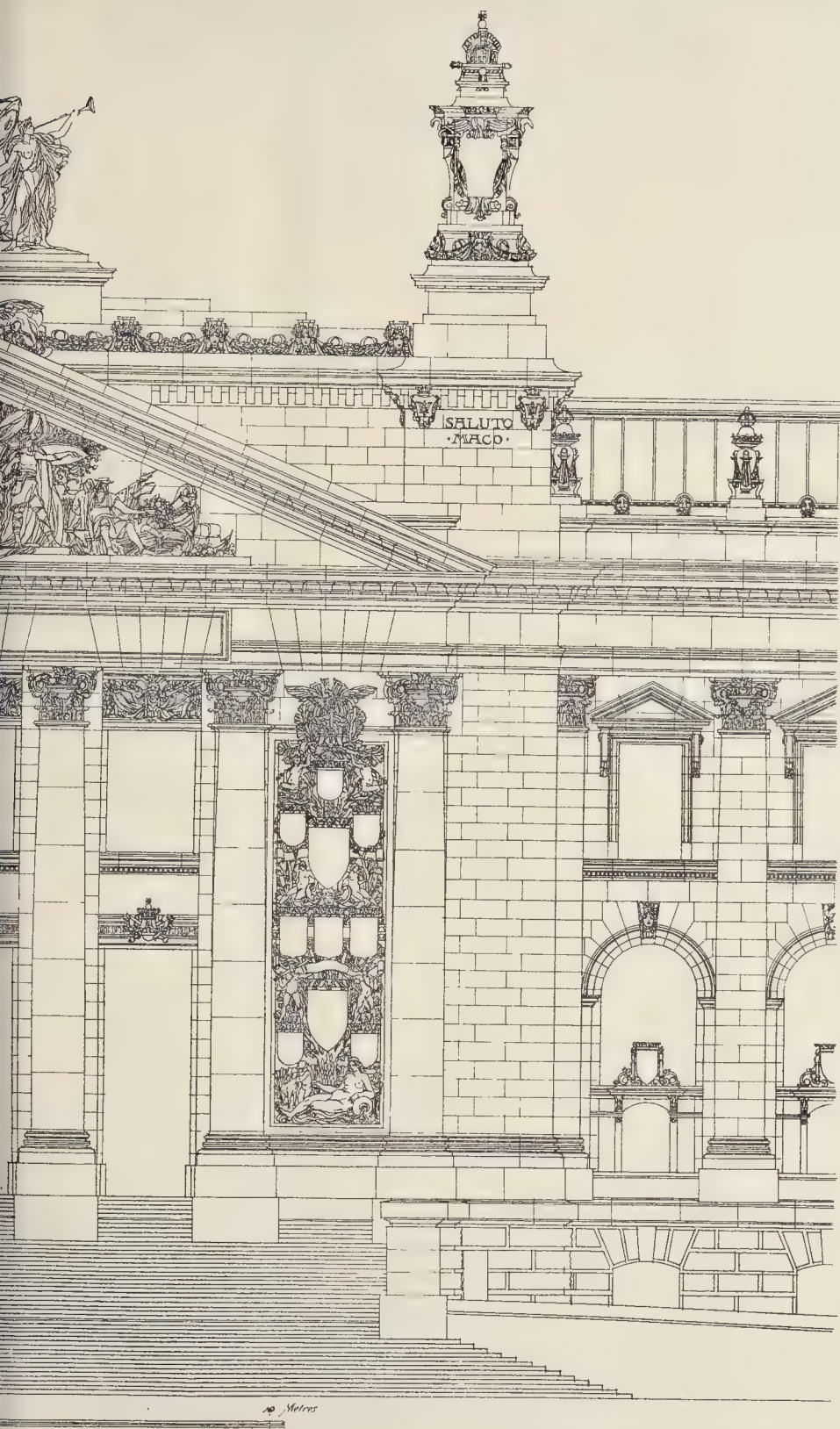


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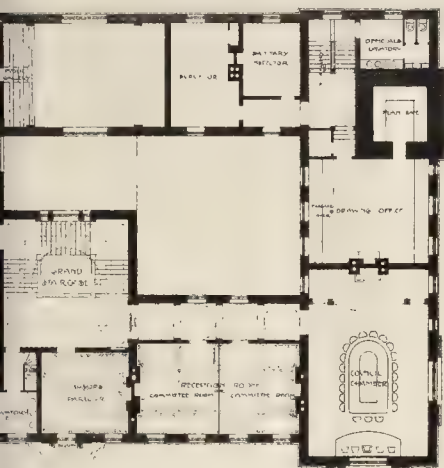






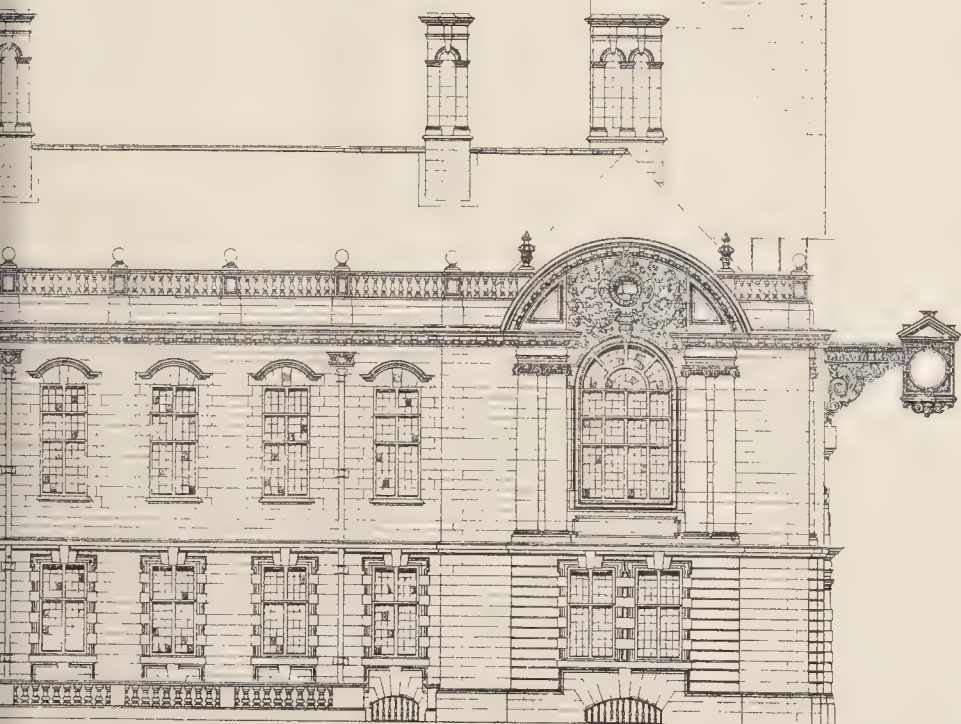






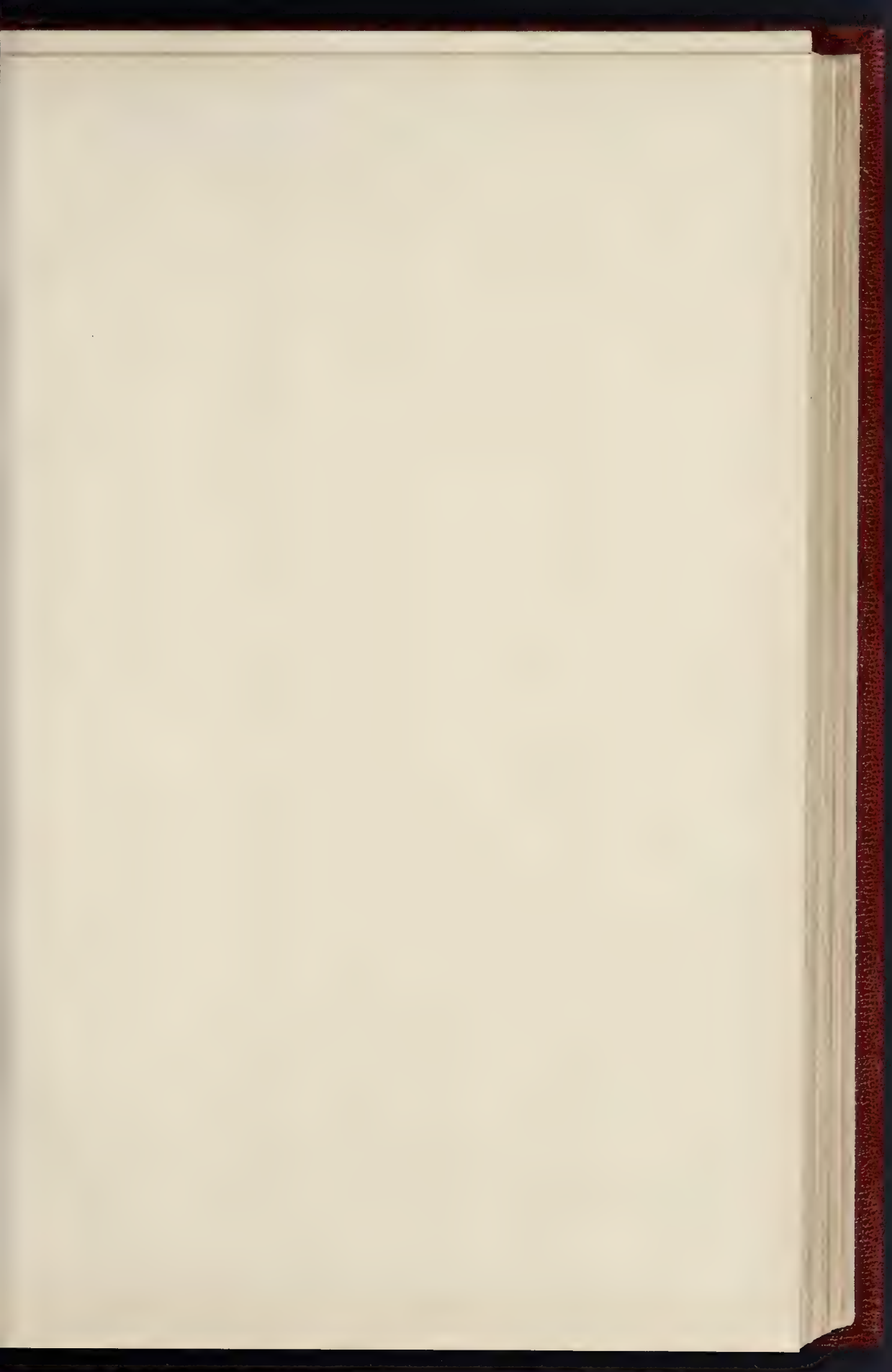
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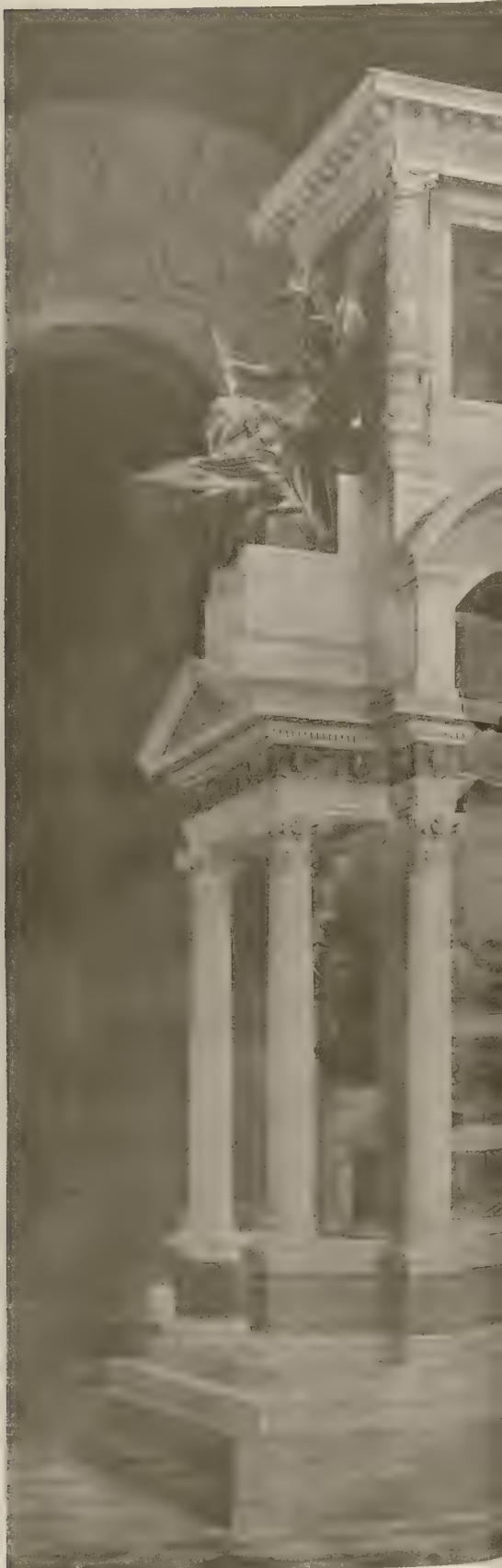
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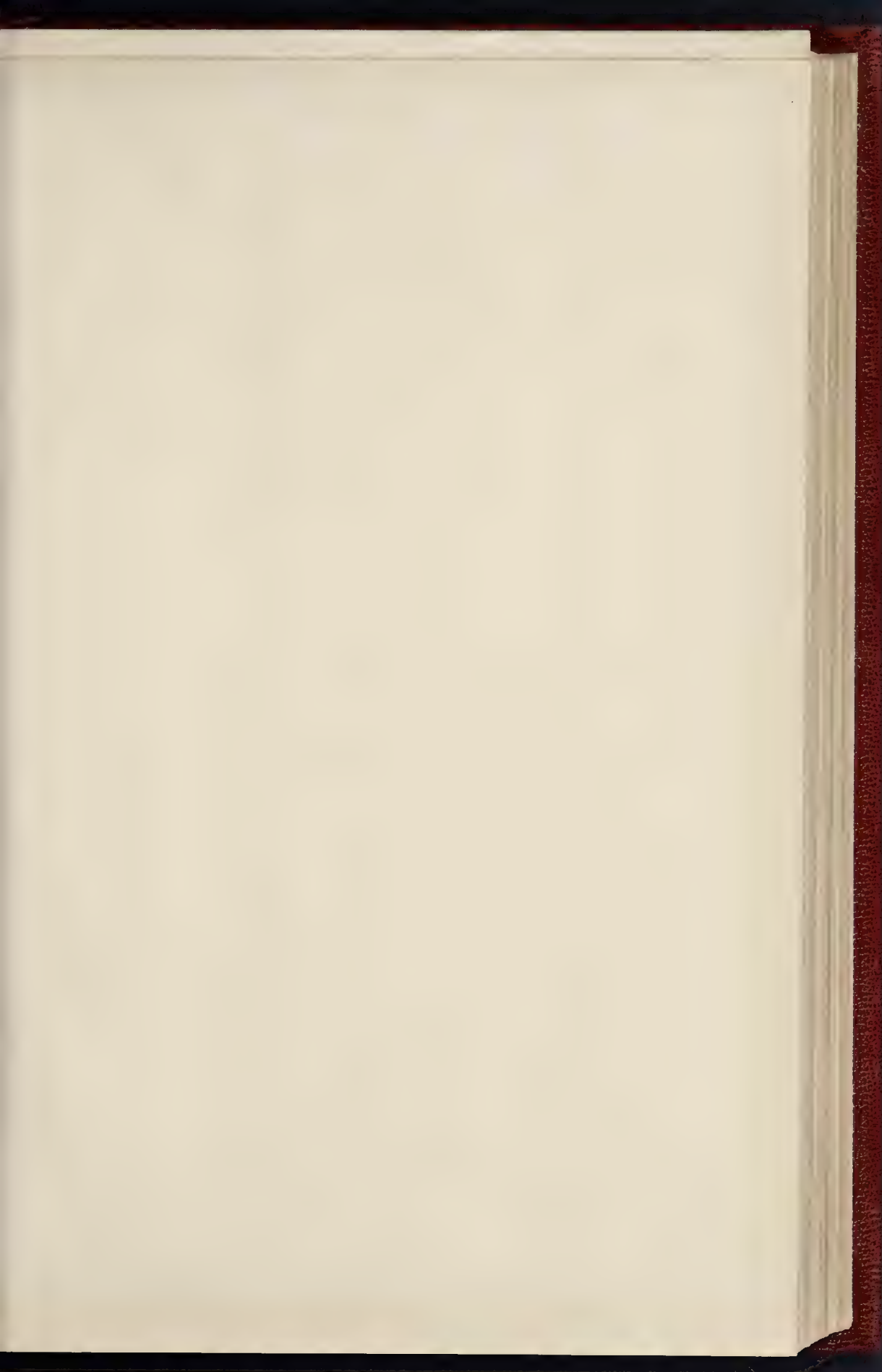


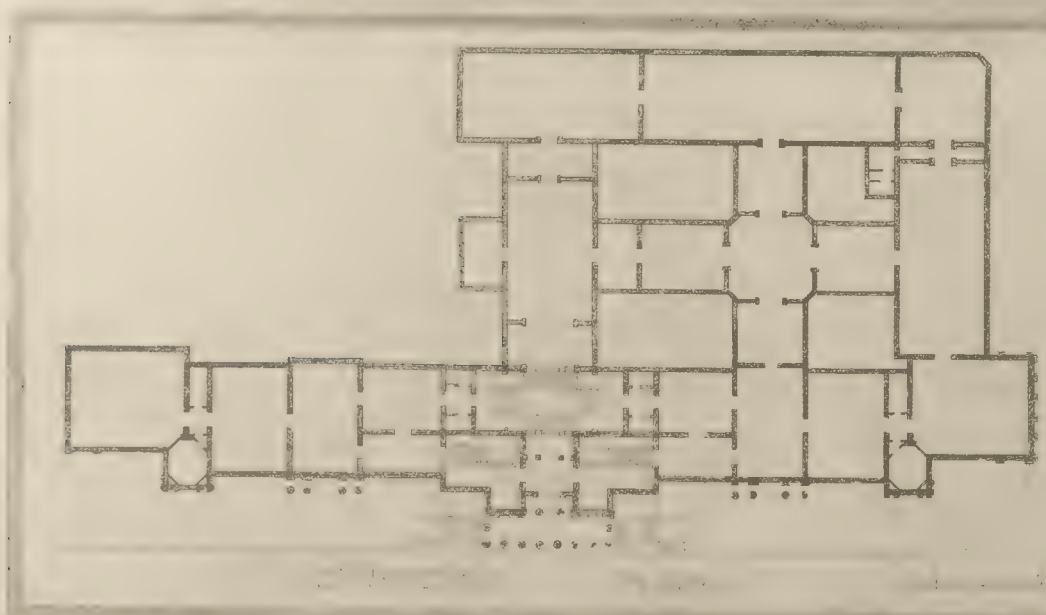


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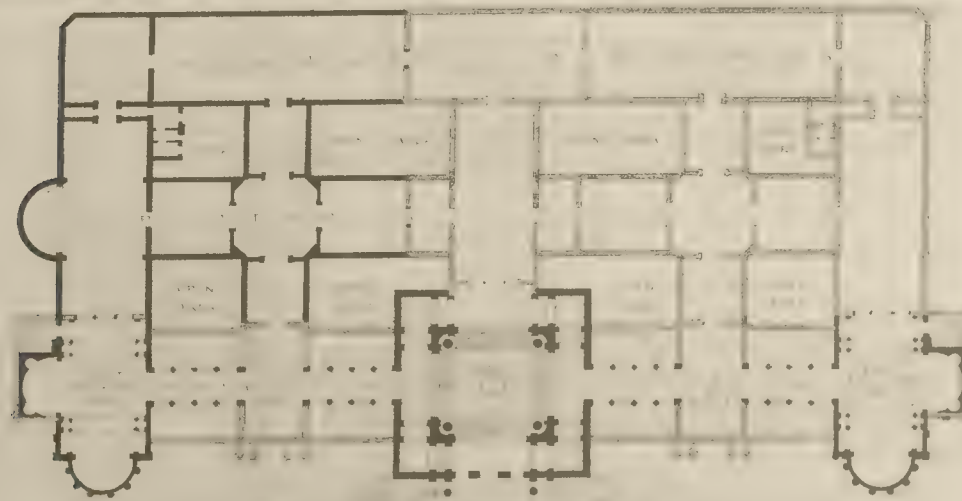












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AS IT NOW FORMS  
A SYMMETRICAL POR-  
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ELEVATION OF THE

H. H. STATHAM - INVENTOR & DESIGNER



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### Westminster Abbey.



THE undertaking to give a series of illustrations of the ancient abbeys of Great Britain, it is a matter of course to commence with Westminster Abbey—"The Abbey" *par excellence*, the interest of which is not only architectural and archaeological, but in a national sense historical. The whole site and its associations are bound up with the history of the English kingdom from its earliest period; and it would be impossible to name any other building in Great Britain which combines architectural and historical interest to the same extent and in the same manner. To do full justice to the subject within the limits of a single article such as this would be impossible; but we may endeavour here to give an outline of its history, combined with some critical considerations as to its architectural qualities.

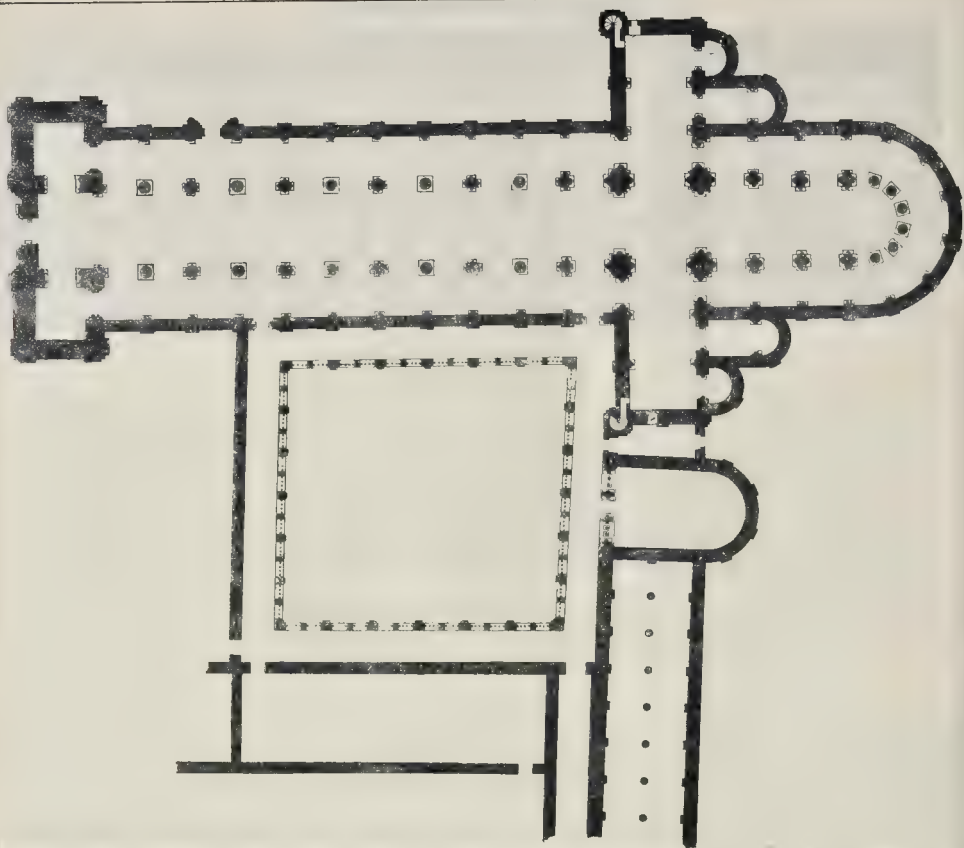
The period when Westminster Abbey was originally built is lost in remote antiquity; and the foundation which history fails to record is still further obscured by fabulous addition. Thus we are told that when the first church was erected here on a small island in the midst of a marsh known by the name of Thorney, the fabric was consecrated

by St. Peter in person, who was ferried over from the Surrey side of the Thames for the purpose. The site originally is likely enough to have been as described, for the configuration of the ground and its low-lying position bear testimony to its probability. The name, too, indicates a minster to the west, doubtless, of the Cathedral of St. Paul; and the dedication to St. Peter appears to point to a designed connexion between the two Evangelists. King Sebert, who founded the one, is credited with the erection of the other, and the record is reasonable. But his was not the first building on this site at least. Roman bricks were found within the area of the present abbey church when the grave of Geo. Edmund Street was dug, and although they may have been simply old material brought from the ruins of Roman London or from some building nearer at hand, yet they may have formed part of some fabric erected on the spot. But doubt as to this becomes reality by the evidence of a recent discovery which has not yet been recorded. When the grave for Lord Lawrence was dug, Mr. Wright, the Clerk of the Works, found a portion of a Roman wall *in situ*; and a fragment of a tile with a pattern on it, and some red mortar formed with pounded brick, are preserved in his office. There is nothing to show the nature of the building; only that it was of Roman date. The Roman sarcophagus, which will be referred to later, was doubtless brought from elsewhere. But its

position when found, in relation to some building, points to the previous existence of a church on the same spot, at least as ancient as the stone cross lid which covers it. After enlargement by King Offa, the early buildings passed through the ordeal of ravages by the Danes, in common with so many others throughout England, the exposed position outside the shelter of the walls of London doubtless contributing to their fate. King Edgar restored them, and we hear of there being but twelve monks established there in his time.

We are on certain ground when we come to the days of King Edward the Confessor, whose palace, adjoining the monastery, on the banks of the Thames, has occupied so important a place in the history of our country to the present day. The rebuilding of the Abbey and its attendant buildings was begun and continued on an extensive scale. The new charter granted to the monks confirmed to them all their previous endowments, with many additions, and mention was made not only of the original consecration by St. Peter, but of the ravages made by the Danes. The church was consecrated in the most impressive manner, in the presence of a vast assembly, nobles and bishops having been summoned to be present from all parts of England. It occurred on the Feast of the Holy Innocents, December 18, 1065, and but a few days before the death of the king, who thus had the gratification of seeing the completion of





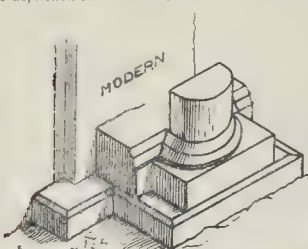
Restored Plan of the Confessor's Chapel, Chapter House, and the Norman Nave.—By Mr. J. P. Micklethwaite, F.S.A.

that portion of the work which he had founded. The buildings erected by him mark a clear and defined epoch in the history of our national architecture, and on this account it is impossible to devote too much attention to the consideration of the remains, all too few and unimportant unfortunately, that actually exist. These may be traced without much difficulty among the mass of superb Gothic work of later date, but the parts that remain are of the monastic buildings only, with one important exception, and the most elaborate parts have disappeared. Of the remains of one of the piers of the choir, on the north side, which still exists beneath the floor of the

Confessor's foundation, and, in addition, the documentary evidences are important and more or less reliable. As is well known, the buildings are described as having been erected in a mode of construction not then usual in England, and the "costly expenditure" spoken of by William of Malmesbury and Matthew Paris alike is amply attested by the large area of ground which they covered. Water was laid on to the Abbey from a spring at the southern end of the present Serpentine in Hyde Park, where a tablet still attests the fact. Large and extensive drains, which in recent years have been mistaken for subterranean passages, still exist in many directions, showing that the sanitary arrangements of the establishment were on an extensive scale. The bulk of these drains, which are formed of masonry, are still in use, and their size affords easy reason for the belief that they were secret passages, while tradition affirms that one actually exists beneath the Thames, affording communication with Lambeth Palace!

Sir Gilbert Scott, in his "Gleanings from Westminster Abbey," quotes from the lives of Edward the Confessor, written between the years 1065 and 1074, wherein the church is described as being raised high, vaulted, with square and uniform ribs, circular to the east, double vaulting to the aisles, of two stories, the cross building contrived to contain the choir in the middle, and to support the lofty tower, which, we are told, had a timber roof covered with lead. A description, somewhat similar, written in Norman-French, during the reign of Henry III., just prior to the rebuilding,

speaks of the church having been built with large square blocks of grey stone. The central tower is again spoken of, as well as the round east end, and two towers at the west front are named. Also a Chapter House, towards the east, vaulted and round bells, sculptured stones, and storied windows. These descriptions, if exact and reliable, would indicate that the Confessor's church must have been a fabric conceived on much the same scale, although not the same design, as the Abbaye aux Hommes at Caen, and it may be, with some features which were only added to the latter building at a later date. We are not left to merely written descriptions. The view of the church in the Bayeux tapestry indicates a building which corresponds fairly well with these descriptions; and it is remarkable for the loftiness of its central tower, which exceeds in the lightness of its proportions anything of Norman date that exists. In fact, the whole design may afford evidence that Norman architecture was not remarkable for heaviness of form when the fabric was relieved by high pitched roofs, steeples, and picturesque termination. It may be remembered that the very truthful picture of Canterbury Cathedral, eighty-nine years or so later than the date of the building under review, affords precisely similar evidence. The actual remains which exist are marked by the solid black portion in the general plan of the Abbey which will be found among our lithographed illustrations. Whether or not Edward the Confessor really completed the church is open to much conjecture. The extent of the undertaking and the shortness of the time



Existing Base of Vaulting Shaft of Edward the Confessor's Choir (North side).

present choir, we are enabled to give an illustration from a sketch furnished by Mr. Micklethwaite. Fortunately, the ground plan of the Abbey enables us to infer

would appear to render this very improbable. It is true that, as we have seen, the narrative speaks of the two western towers, and the Bayeux tapestry view shows a completed nave; but this may have been an anticipation of what was intended or imagined, rather than a record of fact. Mr. Micklethwaite, in his restored plan of the church at the early Norman period, adopts the view that the Confessor's church only included the choir, the crossing, the eastern bay of the nave, the cloisters, and the southern nave wall, or its lower portion, as far as the northern cloister walk extended. In his plan, which is reproduced here, the portions attributed to the Confessor and the Normans respectively are shown in two different tints, which necessarily disappear in this black-and-white reproduction; but the above remarks will sufficiently explain the purport of his plan. Following the analogy of almost every other church, it may reasonably be supposed that the work was begun at the east end, leaving the completion of the western portion to a later time. The Confessor having been buried so soon after the consecration (in front of the high altar) indicates distinctly that the choir, at any rate, was completed. The central tower, too, would require the transepts for abutments, and some portion at least of the nave, for a similar reason.

Be this as it may, and recognising the fact that the documentary evidence, which has been briefly referred to, is in favour of the entire completion of the church by the Confessor, the belief that it was otherwise can only be reconciled to the evidences by the supposition that the nave was finished soon after the consecration. All the documents refer to a completed building. Beyond additions to the monastic buildings made in times following the Norman Conquest, partly referred to in documents, but more clearly indicated by the surer test of the architectural detail, no alteration appears to have been effected in the Abbey church. The Infirmary Chapel dated from the end of the century following the Conquest. But the thirteenth century witnessed great changes in the forms of our Norman minsters, partly necessitated by badness of workmanship and hasty construction, but still more so by the love of change, which in old times as well as now may have operated badly for the preservation of ancient work. We hear of the erection of a Lady Chapel in 1220, an addition doubtless at the east end of the circular aisle enclosing the presbytery. This was speedily followed by the demolition of the entire east end as far as might be necessary to make way for the magnificent fabric which still exists, the pride and boast of our country. The entire east end (except Henry VII.'s Chapel) with its ambulatory and radiating chapels, the transepts and their double aisles, the Chapter House and the first bay of the nave, date from 1220 to 1260, the work having been begun at the east end and extended to the west, the portion of the nave being necessary for the support of the slender piers of the crossing, and to carry the work to a uniform line from north to south. The next few years witnessed an extension of the work of rebuilding the nave. Four more bays were completed, and then the remainder was left, most probably joined more or less well to the Norman portion not yet removed, although the walls of the new aisles were erected in anticipation of the entire rebuilding. In the shading showing the dates on the lithographed plan, we have followed a coloured plan prepared by Mr. Micklethwaite, who regards these four bays of the nave as also the work of Henry III., though executed a little later than the eastern bay of the nave. His reasons for this conclusion, which is a little at variance with the hitherto received dates, were stated in a paper read a few months ago at the London meeting of the Archaeological Institute. The four bays in question have commonly been referred to Edward I. Mr. Micklethwaite admits that the portion undoubtedly attributed to Henry III.

(up to the first eastern bay of the nave) must have been finished before the other four bays were commenced; but he points out that the treatment in the latter is essentially exactly the same as in the eastern bay; that the differences are only so slight as might have been expected to occur in the recommencement of the work after a very short interval, perhaps with a new set of builders, and with a desire to make some slight improvements on the previous work; the plan of the piers is improved, bronze bands are used with the shafts instead of marble, and there is a better treatment of the spandrels of the wall arcades; but the whole feeling of the work is the same. An examination of the building in reference to this theory convinces us that there is at all events great probability in favour of his view, and we have therefore adopted it. The nave remained in its incomplete state until well into the fourteenth century, when the clearstory and the vaulting were finished, and the long line of the nave roof was perfect from end to end. The west front, the central door, and the two towers remained incomplete, and although the early years of the sixteenth century witnessed the completion of the doorway, &c., the towers remained only at about one-half of their present height, with no gable to the front, until the time when the western façade was completed either by Wren or his pupil Hawksmoor, for there seems no positive certainty to which of these two architects the work is to be credited.

Old views of the Abbey are not uncommon which show the appearance of the fabric without the towers. Among these, those of Hollars are supposed to be the most truthful, though we have great doubts whether he merits the reputation for accuracy commonly accorded to him. His northern view indicates how completely the fine portal of the north transept was hidden by a large gabled porch of late date, removed in the last century. Other views indicate a lofty and thin spire, once intended over the crossing, which, fortunately, was never erected. Henry VII.'s chapel, with its delicate and intricate work, stands on the site of the old Lady Chapel of Henry III.'s time, and may be considered as the last addition made to the Abbey before the dissolution. Its erection has been followed by a long series of small remodellings and substitutions of new work for old, to the interior as well as the exterior, and it may be said that the scaffolding is never entirely away from the fabric, so large is its extent, and so costly to keep in repair.

On entering Westminster Abbey, the first impression of a visitor conversant with our English cathedrals must be, in regard to its unusual proportions. The beauty of the groined roof may be probably equalled, the length may be exceeded, but the great height in relation to the width, and its attendant beauty, is not seen elsewhere in England. The spectator feels that he is in a cathedral of the north of France rather than in an English one, until he observes the familiar forms of the detail which is the counterpart of work of the same date in our own country, only wrought in the most elaborate manner. Here is beautiful foliage, boldly undercut and admirably worked, rich moulded arches, polished Purbeck marble, shafted in profusion, and all the other items of detail which distinguish English work from French. The impression of foreign design, derived from the unusual height, is confirmed when the ground plan of the east end is considered. While previous minsters in England had, at most, a few semi-circular chapels radiating from the curved ambulatory, or aisle, surrounding the presbytery, as at Norwich and some few others, here, instead, are six half-octagonal chapels, while the space of a seventh, the Lady Chapel of 1220, occupied the central position. The lines of their setting out are perfect, and the difficult problem of their arrangement, which can be studied in its development from the commencement to its perfection in the earlier French examples, is here found in its most complete form. The

general resemblance to the east ends of Amiens and Reims Cathedrals, if the plans be compared, will at once be apparent. On the north side, the square projection now known as Islip's chapel, and that of St. Benedict's on the south side, are suggestive of slender steeples, such as we see in the choir of the Abbaye aux Hommes, or those which once existed at Canterbury.

Within the presbytery, west of the modern face of the screen, buried beneath the superb mosaic pavement, are the bases of two of the piers of Edward the Confessor's church, of one of which we have given an illustration. They are of plain Norman form, very similar to the somewhat later work at Winchester and elsewhere. They are valuable as being the only known fragments yet met with of the destroyed building, and they indicate not only that the centre line of the existing church was the same as the former one, but also that the latter is wider. The Gothic building could, in fact, have been erected around and over the older one, so far as regards the central portion.

The pavement before the screen deserves special attention as being Italian Opus Alexandrinum, formed of rare marbles, derived most probably from the ruins of ancient Rome, mingled with our own Purbeck marble, and laid in a pattern which is completely Mediaeval Roman. There is another mosaic floor of plainer design in the space behind the screen, so well known as Edward the Confessor's chapel. It will be noticed that, while the mosaics of the pavements are of porphyry and marbles, those of the tomb of Henry III. and in the shrine of the Confessor, where they remain, are of glass.

A small portion of the decoration of the celebrated coronation chair is of the same material. The importance of these art works, it may be remembered, is enhanced from the fact that, apart from the value of the design, there is but one other pavement of Opus Alexandrinum in England—that at Canterbury, where, however, the design is totally different; and no example at all of glass mosaic is extant except a small portion of an ancient Roman pavement at Aldborough. The detail of the screen, the eastern side being ancient, of fifteenth-century work, illustrates incidents in the life of the Confessor.

The transepts have double aisles, the arches being of acute lancet form. The former rose window of the north transept, lately replaced by a new one, was of fifteenth-century design, which it would have been a pity to remove, but that it was a copy executed early in the last century, and found to be all to pieces when the recent recasting of the front took place. The stained glass which then filled it has been replaced, but with the absurd alteration of cutting off the feet of the figures to make them fit the new tracery, which was apparently designed without any intention of preserving the old glass, although it is a good specimen of glass painting of the last century, when such works were hardly ever executed.

The nave presents a curious study of Gothic details of more than usual interest, from the fact that while the general design of the whole is similar in the early and the later parts, which harmonise well in this respect, yet the detail in each case indicates the varying periods of the execution; and the junction at the point where the works of the two periods meet is worthy of observation. The wall arcades have been of great beauty, but are now much cut into for the insertion of modern monuments.

In the space beneath the south-west tower, enclosed by a fifteenth-century stone screen, is deposited the old font of the Abbey of the same date; and the window over it, as well as the corresponding one of the sister tower, is filled with contemporary stained glass. The clearstory windows of the east end are also filled with old stained glass. The pavements are mostly modern, but several specimens of encaustic tiling remain in the chapels, while the Chapter House has a pavement all but perfect except for wear.



At the south end of the western walk of the cloisters an ancient arched recess is now being opened, and a mass of elaborately-worked late Norman detail, built in as old material, has been discovered. A good many pieces of similar stonework have been found in recent years. Elsewhere are deposited various interesting fragments of stonework, including a Norman shaft of later date than the Confessor's time—probably from the former cloisters.

Passing over many curious features of the monastic use of the cloisters, it will be noticed that the western aisle of the south transept is carried above their eastern portion. A reference to the ground-plan, and some irregularities of line, furnish some evidence of interest relative to the size of the Confessor's church. Here the rebuilding joined the early work, and it is apparent that the existence of the east walk of the cloister rendered it imperative to modify the new aisle in the way named. The south wall of the south walk is the ancient north wall of the Confessor's Refectory, the masonry of which is here and there visible. The southern limit of the Confessor's cloister is thus determined, while the northern limit was the wall of the south aisle of the nave. One of the sides being thus determined, these considerations render it almost a certainty that his cloisters were of the same size as at present. Entering from the east walk, the superb double arch of the vestibule of the Chapter House, on which traces of colour decoration are still visible, is passed; and the Chapter House is reached. This beautiful apartment, with its restored vaulting and windows, is a good example of Sir G. G. Scott's genius in "restoration," here exercised with better reason and happier result than in some other instances; its ancient wall paintings are of much interest, and all can be studied with advantage. Its present beauty is in marked contrast with the appearance indicated by not very old views, which show it shorn of its window tracery and vaulting, and filled with shelves and presses wherein were stored the Records of England. Bad as are the acoustic properties, it is matter of surprise how the early Parliaments managed to get through their work within it. Perhaps the debates were shortened in consequence. To the south, the Confessor's work is very apparent, and in the carefully-locked Chapel of the Pyx, the plain cylinder shafts, with their semi-circular arches and vaulting, still remain. Although entrance is generally impossible, a bay or two of similar work is capable of being inspected at the southern end, and it will be noted that an attempt has been made to decorate the plain caps with sculpture at a later Norman period. The extent to which this practice was indulged in throughout England, and the manner in which Early Norman work has been made to resemble that of later date,

has not even yet been fully recognised. It will be noted that the Confessor's masons have invariably worked their stones with diagonal tool-marks, such as exist equally in work after the Conquest. Over the range of vaults, which were formerly the monks' day-room, is the long gallery now used as Westminster School, formerly the monastic dormitory. The walls are, for the most part, of the Confessor's date, and at intervals a window or two may be inspected. One was laid open for inspection, in perfect condition, when the class-rooms of Ashburnham House were erected in 1883. It was wide for its height, the arch-stones and jambs being of Caen stone, the favourite freestone which is used throughout the early work; the stones were sawn, but the arch-stones were not truly worked, and the setting had to be accomplished by wide joints. All the freestone is set with very wide joints; those to some of the cloister stones measure  $1\frac{1}{2}$  in. in thickness. When the works referred to were carried out a series of seven closets of the Necessarium were found, built above one of the sewers already referred to. The range had extended, apparently, beyond Inigo Jones's Ashburnham House. Below, part of the Misericorde was met with, and traces of inscriptions scribbled on the walls in idle moments remained; one of these, in black letter, having reference to a certain pie, referred to some good cheer of long past days.

Above, on the first floor, close to the closets, a Mediæval fireplace was found, with a comfortable arrangement of the hob, which enabled some creature comfort to be kept warm when wanted. Some three or four others have been found elsewhere from time to time. These curious relics of the past were all cleared away for the new work, as were also some traces of ovens, which were laid open for a short time at the south-west angle of Ashburnham House. They were formed of thin tiles. It is of the more importance to place their discovery on record since they were seen by but few people at the time, and the position of the Abbey kitchen has been the subject of discussion.

It may be added that the western gable of Ashburnham House is ancient, and it is evidently an external wall.

It is an impossible task to attempt to describe the monastic buildings fully. It may suffice to say that at the dissolution of the monastery the buildings were subdivided to form houses for the canons. No systematic rebuilding has ever taken place, but changes for individual convenience have constantly taken place, sometimes to reveal a curious feature of old work, sometimes to cover it over for centuries; and alas! sometimes to destroy it. The little cloisters open from the Confessor's work by a wide passage, the two arches to carry the walls overhead being ancient, and the barrel vault of recent date. The arches enclosing the cloister garth are of brick, probably the work of Wren, the wrought-iron gate being of passable design. The walls of the enclosure are of fourteenth-century date, built to a certain extent of very small stones, in which may be noted some freestone with signs of former use, notably the shaft of an early column next to Mr. Cheadle's door. At the south end of the west walk an early Norman window has recently been laid open. Its purpose was apparently to ventilate the sewer referred to. Above it is a curious piece of ancient construction. The ashlar work is arranged in squares laid diagonally, and between a course similarly laid, worked in dark stone.

These cloisters occupy part of the site of the infirmary, which opened into the Infirmary Chapel, which was dedicated to St. Catharine. Perhaps even the nave and aisles formed the infirmary either wholly or in part, the chancel being screened off as the chapel. The outlines of the walls and the bases of the shafts, hidden more or less by modern brickwork, alone remain. They were cleared to the extent seen a few years ago. They are of late Norman date.

The Jerusalem Chamber and adjacent

buildings formed the Abbot's House, some of these being now included in the Deanery. The former chamber contains an admirable Elizabethan chimney-piece, and in the large window are some roundels of Norman stained glass inserted. The long table in what was formerly the Abbot's Hall is said to have been made out of some of the wreck of the Spanish Armada.

Some of the curious Elizabethan panelling in the neighbouring rooms would be all the better if it were cleared of its many coats of paint.

The present entrance to the cloisters on the west formerly led into the conversation parlour, and over, it very probably, was the guest chamber, or one of the guest chambers and its chapel.

The materials of the Abbey demand a passing note. The walls of the Confessor's work show a large amount of Caen stone, ashlar, and dressings, as we have already seen, backed up with rubble, the walls being of great thickness and solidity. The later works have walling of Kentish Rag, variously squared and laid, the bulk of the dressings being of Reigate or similar freestone, backed up with rubble, doubtless derived from the former buildings as far as it would go, the whole mass standing, not upon a feeble foundation, as is so usual in ancient churches, but upon a solid mass of concrete and rubble of considerable but varying depth.

This mode of construction was all the more necessary, since much of the subsoil is very loose sand; a good foundation when subject to compression, but which is liable to flow in a stream when dug through. Much of the Confessor's work was doubtless broken up to form this mass. The floor-level, after so many years of the rise of the external ground, is still in good proportion to it, indicating that it must have been once well above the present ground line.

A few blocks of unknown stones are occasionally met with, but the names of most can be determined. It may be worthy of remark that much of the work of the latter part of the fourteenth century is of Roches Abbey stone. A good deal of the cloisters is formed of it. It was used again in Abbot Islip's work. A single block of Quar Abbey stone has recently been found high up in the walling by Mr. Wright. It had formed part of some Roman building, for red mortar still adheres to it.

Some few of the Mediæval bases had plinths of Portland stone, although the use of this material in London is supposed to date only from the seventeenth century; most of the later works of that century and since were done with Portland stone. The recent ones have varied, Chilmark stone being now used for the present works of refacing in progress on the south side.

From the crossing eastward to the Chapel of Henry VII., the Abbey is a vast storehouse of Mediæval monuments, exhibiting some of the choicest specimens of workmanship in stone and metal, sadly desecrated, it is true, and despoiled of the many jewels that once added so much lustre to the shrine of the Confessor and its surroundings, but still a magnificent series. Besides these are a very large number of monuments of the Renaissance period, very stately, and often highly enriched with decorative work and heraldry, but their erection against the outer walls of the chapels entailed the removal of the delicate mouldings and carving of the arcading, and however much we may admire the beauty of some of the monuments themselves, it cannot but be regretted that greater respect was not shown to the Mediæval work.

The Confessor's shrine, and the Royal tombs immediately surrounding it, form a very valuable series of monumental examples from the time of Henry III. to Henry V., including mosaic work, metal work, alabaster and stone carving in great variety. The mosaic has been much destroyed, both on the shrine and the tomb of Henry III., but enough remains on the twisted columns of the former, and on the

\* A word of comment is required here. It will be observed that Mr. Micklethwaite's restored plan shows the lines of the cloisters very much askew, and on the lithograph plan, based mainly on a careful plan prepared some years ago by Mr. R. Platt Spier, no such distortion is visible, though the western walk of the cloister is shown a little out of square with the nave wall, trending towards the west as it recedes from the church, and this, as far as we can judge, is correct; at least, if there is any deviation from the right-angle here it can hardly be more than that. Mr. Micklethwaite believes (as is indeed most probable) that the lines of the present cloister follow those of the Confessor's cloister; but if so, he has certainly exaggerated the skew element on his plan. On the other hand there is a perceptible bend westward in the line of the east walk of the cloister, at the point where it leaves the angle of the transept, as anyone may see by standing at the transept door and looking along the cloister aisle southwards; the bend here is as decided a deviation from the rectangle as Mr. Micklethwaite's plan shows, but this deviation is only, as far as the eye can judge, in this portion of the east cloister walk. This alteration of angle in the east walk is not shown in our lithograph plan, which in this small detail is therefore inaccurate. But the fact is that the various slight deviations of line in a great Mediæval building like this, built and added to at various periods, could only be realised with absolute accuracy by a survey with the theodolite, a piece of work we could hardly have undertaken, even if the authorities of the Abbey could have found it convenient to permit it. But we decline to believe, on the evidence of our eyesight (including a bird's-eye study of the cloister-garth from the roof of the nave aisle), that the present cloister is as much askew as the ancient one is shown on Mr. Micklethwaite's plan.



north side of the latter, to give an idea of the once gorgeous effect of these two examples, the earliest of the series. In strange contrast is the perfectly plain tomb of Edward I., without carving or effigy, situated immediately westward of Henry III.'s monument in the north-west angle of the Saints' Chapel. This monument is the only one remaining without decorative treatment, each of the others having some special point of interest: Queen Eleanor's beautiful monument, now much defaced, with brass effigy and elaborate wrought iron grille, remarkable as being of English workmanship; the tomb of Queen Philippa (1369), with its elaborate canopy work in alabaster, remaining on its south side facing the ambulatory, and the larger one over the head of the recumbent effigy; Edward III.'s monument, a late fourteenth-century tomb, having a wooden canopy, and a brass effigy, inscription, and mourners on the south face; and finally the much defaced monument of Richard the Second and his Queen, the canopy over painted with a representation of the crowning of the Virgin.

The tomb of Henry V. has fared worse than the others, and the rough wooden effigy has lost its covering of silver. The wrought-iron gates are noticeable, and the elaborate canopy and figure work of the chantry itself; the altar was that of the Annunciation.

In the floor of the Saints' Chapel, immediately below the back of the altar screen, is some of the "Opus Alexandrinum," and a brass of John of Waltham. East of the shrine is a slab with inlay of red and white mosaic, and a marginal inscription in Lombardic characters.

The beauty of the Royal monuments is, perhaps, excelled by that of the tombs north of the sanctuary—all of the Decorated period—commemorating Aveline of Lancaster 1273, daughter of William de Fortibus, Earl of Albemarle, and married to Edmund Crouchback, Earl of Lancaster, whose monument is the most easterly of the three. He died in 1296. The third tomb, that of Aymer de Valence (1323), is thus slightly later than the Crouchback, and of smaller dimensions on account of the space already taken up by Aveline's tomb. All three are covered with detail and foliage of the most exquisite kind, and a row of mourners on the ambulatory or north side deserves careful study. The spandrels of Aveline's tomb are particularly beautiful. The monuments in the chapels surrounding the Saints' Chapel, and forming the *chevet* round the apse, are of great variety and interest. They cover a period from the thirteenth century to the late Renaissance, and in one or two instances bringing examples of monumental work down to our own day. Marble work, mosaic, enamelled metal, and carving and effigies in marbles and alabaster, are all represented. The first chapel on the north side is that known as Abbot Islip's, with a loft over containing the wax effigies which were carried in front of the coffin at the funeral of those represented. The front of the chantry towards the ambulatory is a Perpendicular design of two stories, the lower portion pierced and admitting of a view of the chapel proper. The upper part is tabernacle work, forming a screen to the upper story, the string dividing the two being ornamented with Islip's name and rebus. His initials and a rebus are also on the wall over the entrance to the Chapel of St. Erasmus, which virtually forms a vestibule to the first of the octagonal chapels, that dedicated to St. John the Baptist. Three tombs with effigies of no particular merit in themselves divide the chapel from the ambulatory, and commemorate Bishops Colchester, Reithall, and George Fasset, Abbot of Westminster, 1498-1500. This latter has a stone canopy over it, and in the cornice moulding is one of those excellent examples of a decorative monogram, in which the Medieval carver excelled. Against the north wall, standing in front of the arcade, is a small arched tomb, with little ornament but

a delicate series of caps and trefoiled arches, said to be to the memory of Hugh and Mary de Bohun, c. 1300, children of Humphrey de Bohun, Earl of Hereford. In the centre of the chapel, taking up a large amount of its floor space, is the monument of Thomas, Earl of Exeter, who died 1622-3, a very large altar-tomb in black and white marble, with effigies of the Earl and his first wife. The marginal inscription is a good example of simple lettering, boldly designed, and round the tomb are several shields of arms.

The Hunsden monument, against the eastern wall of this chapel, is the most gorgeous and the largest of the Renaissance monuments in the Abbey. It reaches to the level of the springing of the chapel windows, and is a marvel of workmanship in marble and alabaster, and amongst its decorations are a series of shields showing the family connexions, fine examples of heraldic carving. The early wall arcing in this chapel, where not destroyed by the insertion of the monuments, is worthy of notice, also the vaulted vestibule known as the Chapel of St. Erasmus. Next in order is the Chapel of St. Paul, interesting chiefly for the fine altar tomb of Sir Giles Daubenay and his wife (1507 and 1500 respectively), who was Lord Chamberlain to Henry VII. The altar-tomb is of Purbeck, the effigies of alabaster, elaborately coloured. Round the tomb are a series of shields with the arms of the family and their connexions, the whole being enclosed within a wrought iron railing of excellent design with standards at the angles, ornamented with the Daubenay badges. Altogether this is one of the best and most perfect specimens of its date remaining in the Abbey.

Forming part of the screen between the chapel and ambulatory is a Bourchier tomb with banners supported by a lion and an eagle, good specimens of Mediaeval heraldic carving, and deserving to be carefully drawn before they become more decayed. The other monuments in this chapel are of the Renaissance period, and are not such as to call for any special mention.

The two corresponding chapels on the south side of the ambulatory contain a larger proportion of Early to Late monuments. The chapel of St. Edmund is particularly rich. Here are the effigies of William de Valence, of wood encased in metal, with the well-known enamelled shield charged with the Valence arms. The figure rests on a wooden tomb, in its turn carried by a stone base with the arms of the family and of England. On the opposite side of the doorway into the chapel from the ambulatory is the tomb of John of Eltham, a beautifully-modelled effigy in alabaster, the sides of the tomb retaining a large number of the "mourners," little statuettes, in this case excellent examples of the costume of the period. Close by this latter tomb are the children of Edward III., a small tomb, with the effigies recumbent on it, of William of Windsor and Blanche de la Tour.

In the centre of the chapel, on low tombs are three magnificent brasses, that of Eleanor de Bohun (1399) being by far the finest and the most perfect of those remaining in the Abbey. The workmanship of the brass effigy, canopy, and shields is of the highest order. Adjoining this is another large brass commemorating Archbishop Robert de Waldeby (1397), also represented under a canopy. The third is to Sir Humphrey Bourchier, killed at the battle of Barnet, with a good example of mantlings and heaume. Behind this in the wall is a tomb of Sir Bernard Brocas, having a recumbent effigy under a canopy. The tomb of Frances, Duchess of Suffolk (1559), is a marble altar tomb with recumbent effigy, notable for its heraldic work.

The remaining chapel—that of St. Nicholas—has a good stone Perpendicular screen dividing it from the ambulatory. The principal monuments of interest are a Renaissance tomb of Villiers, Duke of Buckingham, in black and white marble, occupying the centre of the chapel; a Perpendicular

canopied monument for Bishop Sutton, and a brass of Sir Humphrey Stanley with three shields, and an effigy near the entrance. On a tomb above this is a delicate fragment of carving, supposed to have formed part of a *recedos* to the altar, which formerly existed where the monument of Lady Fane now is.

Passing up the steps to the chapel of Henry VII., the fine altar-tomb of that monarch and his Queen, standing in the centre of the apse, is the chief object of interest. It was the work of Torregiano, and is said to have cost 1,500*l*. The effigies are of bronze, gilt, the tomb on which they rest being of black marble, with a delicate frieze of alabaster and brass ornaments. Enclosing it is a magnificent screen of bronze, once ornamented with figure work, and exhibiting the familiar badges of Henry VII. in its panels.

Eastward, in the small chapel at the end, is the slab covering the spot of Cromwell's burial, but his body no longer rests there, having been removed two years after interment. A modern monument to the late Dean Stanley is interesting as a memorial of the present time, and for the excellent likeness of the recumbent effigy.

The chief monuments of interest in the aisles are those of Queen Elizabeth on the north, and of Mary Queen of Scots on the south, well-known monuments, with good Renaissance detail and effigies.

The small chapel of St. Benedict, leading out of the south transept, and in a corresponding position to that of Abbot Islip on the wall, has a large number of monuments, of which that of the Earl and Countess of Middlesex (1645), and the earlier altar-tomb, with effigy, of Abbot Langham, are the best.

It will be unnecessary to enter into a detailed description of the numberless monuments in the transepts. That of Chaucer in the south transept (of Purbeck marble), and of Sir Francis Vere and of Lord Norris in the north transept (two elaborate Renaissance examples), are the most noteworthy.

The north transept, known as the "Statesman's Aisle," is crowded with a very large number of monuments that are not, perhaps, conspicuous by their beauty, but which, nevertheless, form part of the history of the Abbey. The south transept is fully explained by its name of "Poet's Corner." The west wall, next the minster room, is known as the "Historical Side."

The nave is likewise full of monuments, chiefly mural, their design being in most cases of no particular interest. One of the most recent however, that of the late Mr. Fawcett, by Mr. Alfred Gilbert, R.A. (placed here in 1887 to the late Postmaster-General) is deserving of notice as one of the most successful and original in conception of modern monuments in the Abbey, or anywhere else in this country. It is on the south wall of the south-west tower.

The aisle arcing of the nave was ornamented with armorial shields of the benefactors to the Abbey during its construction. Of these sixteen westward of the crossing were carved and painted. Four have disappeared, but those remaining are excellent examples of heraldry. The others, partially obliterated, were painted in the spandrels of the arcing, and are later in date.

Under recesses in the south walk of the cloisters are monuments of early abbots, but the names on the stones above them are of modern date, and probably incorrect. One is a low-relief effigy with pastoral staff.

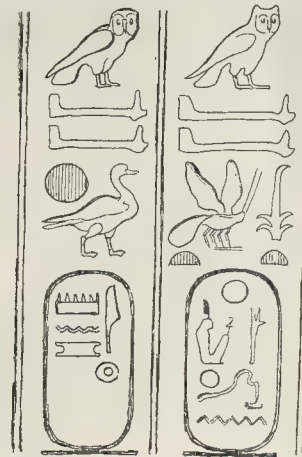
The Abbey is not rich in ancient glass. The oldest portion is in the triforium of the presbytery, and consists of fragments of *grisaille* of early fourteenth century-date. In the east window of Henry VII.'s Chapel is a figure of the founder, and in the chapels and aisles of the same are many old quarries with initials "K. H." crowned, and badges—the portcullis, fleur de lis, &c.

The three windows of the apse were made up in 1753, with a mixture of old and new glass. The later date was found amongst the pieces of the new work. There are some

It appears to have originally signified the axial rotation of the heavens round the Pole



## SYMBOLIC ORIGIN OF ORNAMENT.

EGYPTIAN HIEROGLYPHIC WRITING  
& DERIVATION OF LETTERS.

FRAGMENT OF PAINTED WALL, BELONGING TO RAMSES II TO HIS ROYAL ARCHITECTS, TAKING THE NAMES OF THE GODS OF EGYPT TO THE XIX DYNASTY  
[BRITISH MUSEUM]

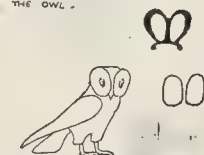


EGYPTIAN TREATMENT OF BIRDS.  
PAINTED MUMMY CASE  
BRITISH MUSEUM.



"Origin and Use of Ornament."—2.

SELECTION OF ROMAN & GOTHIC CAPITAL M. DE RIVER FROM THE OWL.



SUGGESTED DERIVATION OF I.



to Dr. March, who argues with great force, a mythography, or a symbolism of origin and descent, and these "paddles" are really tables of the descent of tribes, so that here again, if this is so, we have an instance of ornament arising out of symbolism and picture writing.

## II.—Structural Association and Derivation.

Structural imitations in the early forms of ornament betray their origin in the necessities of handicraft and use.

We get the chequer from the plaiting of rushes or fibre in a mat, or the crossing of threads in weaving (3).

In the wattled work on the walls of primitive dwellings pattern is identical with structure. One was found at Ebersbrog impressed on clay, the clay being smooth on the other side. It is not difficult in following this clue to trace the evolution of certain well-known types of pattern (3).

We thus get two universal principles in ornament construction, the meander and the scroll, which through all their variants may yet be traced back to their primitive origin in wattle and wickerwork. There is a family or type of border design, too, which apparently had its origin in fringes and tassels formed by tying up the loose ends of woven or plaited rugs. We see it in marked development in Assyrian decoration—a people given to use pavilions and awnings with pendant fringes and tassels, and also fringed garments and rugs (4). We may trace the motive in evolution from the primitive mat with tied ends, through Assyrian, Persian, Egyptian, and Indian forms, to the so-called "honeysuckle" of the Greeks.

Another marked structural source of ornamental motive may be found in what was probably the earliest form of handicraft—"the fastening of two things together" such as a stone axe to its handle by means of fibre or thong.

The crossing and overlapping of successive layers of such strings or thongs, producing a kind of inseparable association in the mind, was perpetuated in other materials as ornament, when it was no longer functional.

Such motives allied with the spirals of the cord or rope—a common form of moulding on early pottery—led to a whole family of characteristic ornament, the convoluted knotted and interlaced ornament (3 and 5) becoming a marked development of the Celtic race, although its prototype existed among the Asiatic peoples.

It is difficult to resist the conclusion that the Norman zig-zag moulding belongs to this family, while its association with woodwork comes out in the common form of capital used in this period, which suggests the round branches of trees cut off at the top (5), bound at the junction with the shaft by a fillet, and sometimes showing the line of the bark.\*

When we come to architecture, however, we find an abundance of patterns founded on structural motives, some of which have been already alluded to. It is well known that the forms of Greek architecture owed their origin to the necessities of wooden construction, sufficiently proved by looking at this tomb at Antiphehus, Asia Minor (6), which imitates in masonry the projection of the tree stems, forming the ceiling of the chamber, and from these ends, squared, was developed the gutter, and afterwards the dentil ornament.

It seems probable, as some think, that the well-known egg-and-tongue moulding is another development from the same kind of structure, the egg representing the end of the timber, and the vertical dart or pendent the hanging ends of the ligatures which tied the beams together or fastened the shingles of the roof (6).

The working of thin plates of metal in repoussé for wall coverings and shields would have its influence, and its readiness in the forms of thin bands and wire to twist into spiral curves, as in jewellery, no doubt also

\* We cannot agree with Mr. Crane in this idea as to the evolution of the Norman capital.—Ed.

Star, but was later used as a benedictory sign or mark of good luck. When the feet were turned to the left the nocturnal movement of the stars was intended, and when the feet turned to the right the diurnal movement of the sun was supposed to be intended. It is frequently placed in a circle. A very few of its stages will suffice to show its incorporation into ornament, however. (See illustrations, 1. Further illustrations are referred to by the number of the group in which they occur.)

We may thus see how a sign purely symbolical, used as we should use writing, becomes in course of time a decorative unit in ornament.

The circle, a universal and important element in ornamental design, of all times and kinds, appears early as a symbol for the sun. There is a well-known pattern unit, a series of concentric circles surrounded by dots, which occurs on the Annam stone (1), and in Anglo-Saxon dress patterns in repetition, but it is also found with our first (axial rotation) sign in the centre. We thus get the movement of the stars as well as the Northmen's cosmic system, the first inner circle signifying Midgard, the earth; the second Asgard, the abode of the gods; the third Utgard, the world beyond inhabited by giants and evil spirits. So a good deal may be packed into the compass of a circle. Here is a piece of Scandinavian gold jewellery (1) from the Copenhagen Museum, which not only shows the axial revolution or solar sign (swastika) as a main feature, but in detail the ornament is entirely composed of rayed circles thus concentrically arranged.

Other symbolic signs, such as the meander or zig-zag for water and the fire-symbol, become, by use and wont, in course of time

ornamental units repeated in patterns for their decorative effect (1). Here is an instance of the use of the zigzag as the entire ornament of a vessel, with the exception of the little footprints which fill the intervals suggestively. Thus for the fundamental elements of ornament and design generally, we go back to the universe itself—the sun, the stars, the movement of life, and early man's thoughts regarding them.

The letters of our Roman alphabet, which in their finest types retain a fine ornamental dignity and character in construction and line, and (as our designers and artistic printers know) have great decorative value when appropriately used in square masses, are descended from primitive signs and symbols full of significance, and they take us back to the picture-writing and hieroglyphics of the ancient Egyptians, who perfected a most elaborate system of symbolic writing, which, at the same time, whether we look at it in detail, in the design of its units, or its general effect upon a wall, is most striking and ornamental (2). The power of their sculptor and painter scribes in abstract characterisation, by means of line and mass evolved by the necessities of compression, and repetition is wonderful, and may be profitably studied by modern designers.

There are remarkable instances of symbolic human forms treated as ornament, and themselves giving rise to abstract forms and units of pattern, to be found in the carved work of the South Sea Islanders.

Polynesian ornament, such as is shown in these types, and in the derived ornamental forms of zig-zag (or shark's teeth) crescent-curves, and varied circles carved in constant repetition over the whole surface of the sacred "paddles" so called, is, according



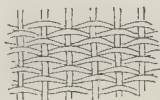
## II. STRUCTURAL ORIGIN OF ORNAMENT



RUSH MAT



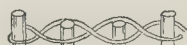
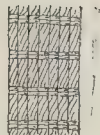
TEXTILE



WATTLE-WORK



FROM LAKE-DWELLINGS

STRUCTURAL BASIS OF  
MEANDER & SCROLL  
PATTERNSORNAMENT DEVELOPMENT ON  
THE BASIS OF THE  
STRUCTURAL BASISBRONZE SHIELD-  
CYPRUSBRONZE SHIELD-  
CYPRUS

ASSYRIAN-GILGEOSE

GREEK VOLUTE

"Origin and Use of Ornament," 3.

was a source of motive in early ornament, though metal, perhaps, was subject, in the first place, to the influence of its predecessors, wood or wattle.

Throughout architecture, as has been said, in all the various forms of its development, we may trace the close connexion between use and ornament; constructive uses leading to motives in ornament—Ornament, as it were, making use of Use—to further its own development, the different types and treatment of ornament corresponding so closely with structural characteristics that periods and styles of architecture can be distinguished by their ornament alone, much as a tree may be known by its leaves or flowers.

Thus, the architecture of the lintel in Greece and Rome naturally developed horizontal mouldings and beadings in cornice, frieze, and entablature, relying for structural emphasis upon these, and the capitals and bases of the columns, as well as on the vertical fluting of the latter: reserving the interstices of the structure—the hollow of the pediment and the metopes, or panels of the frieze between the triglyphs, for figure sculpture, as in the Parthenon; while the frieze of the outer wall of the actual temple—the cella—within the outer row of columns is treated as a continuous band of delicate sculpture. Now I think one may say that the human figure was really the ornament of the Greeks, just as it is in a different way with the Polynesians. They used it freely, and designed their groups and friezes on ornamental principles, while their ornament proper is comparatively restricted and limited to borderings which show a constant recurrence of the same types. In fact, their buildings and ornaments might be described as a framework for their sculpture, except that all together form so perfectly united a whole.

In the well-known frieze of the Parthenon you may trace a certain subtle rhythm and counterbalance of parts, whilst its general flatness of relief unites it with the wall. It

remains a typical and ideal example of decorative sculpture, yet when we come to the bold treatment and high or complex relief of the groups in the pediments and the metopes, we shall find the same ornamental principles governing them, as regards treatment in relation to the spaces they fill, as well as in their ornamental relation to the building as a whole, to which they give point and meaning.

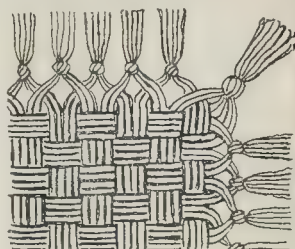
The same ornamental use and mastery of the figure is shown in the exquisite vase paintings of the Greeks, where again the shapes of the vessels (instead of architectural spaces) seem to have suggested the grouping and spacing of their surfaces.

In one clyx by Nikosthenes, we may note the way in which the beautiful lines of the ships and curves of the sails repeat one another in variations, at the same time falling into and expressing the contours of the vessel they decorate.

In another well-known design, too, of Peleus wrestling with Thetis, how finely thrown in the group in the circle; how ornamental in line and detail. There is, too, a curious correspondence in form to be noted between the interlocked hands of the wrestlers and the form of the fret or key pattern forming the enclosing border, which looks more than accidental, and may point to its actual meaning; though I believe the fret itself is supposed to have a textile origin. It is a pattern that constantly re-appears, and is certainly remarkable for one thing—that it illustrates in a simple manner one very important principle in ornamental design, I mean a certain equalised distribution of line or form in relation to its ground; a principle which, though capable of being treated with considerable elasticity and variation, yet runs through the whole of ornamental design, and really defines it perhaps more than any other from purely graphic or depictive design.

The Greeks, however, were not alone in the ornamental use of the figure, though they developed it to such freedom and per-

fection. The Egyptians, the Assyrians, and the Persians all used figures and animals ornamentally in their wall paintings and sculptures. The abstract treatment of birds and animals in Egyptian art has already been mentioned. No less remarkable is the Assyrian treatment of beasts, especially lions, which are often extraordinarily fine. As an instance of the ornamental use of figures by simple repetition, there is no more striking instance than the frieze of archers from the Palace wall of Darius, or the Acropolis of



MAT

STONE DOOR SILL  
INCISED  
KHORSABAD

ENAMELLED TILE ASSYRIA



GREEK ENTREMET ORNAMENT.

"Origin and Use of Ornament," 4.

Susa, destroyed in the reign of Xerxes, 488-486 B.C., built up in separate bricks, coloured and glazed, each figure being a duplicate of the other, though alternating in details of pattern and colour, forming a horizontal pattern in coloured relief. A good coloured cast may be seen in the Persian Court in the South Kensington Museum. I believe we owe its presence there, as also other very valuable additions for decorative and architectural study, to the artistic insight of Mr. Armstrong.

The repetition of figures as ornament or in ornament is often declared to be wrong in principle; but here at least is an instance of its ornamental success. Much no doubt

depends upon the severity and simplicity of treatment; but what in art does not depend upon treatment?

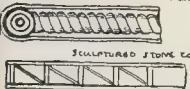
In Gothic architecture, too, figure sculpture generally holds a very important ornamental place, the figure sculpture of the thirteenth century in some instances reaching remarkable simplicity, grace, and dignity, with a certain sweetness of expression which rivals the finest period of Greek art, possessing, too, the same rare ornamental sense or decorative quality. The figures from the west front of Auxerre Cathedral, for instance, casts of which are to be seen in South Kensington Museum, or the noble sculpture from Amiens uniting figure sculpture with architectural ornament and construction in perfect harmony.

### IMITATIVE

STONE ANG OF MONTEZUMA II



EBONY COMB ASSYRIA



SCULPTURED STONE CORNICE EGYPT



BACK OF BRONZE CHAIR DEFAVALL



NORMAN CAP. PETERBOROUGH CATHEDRAL

TREE STUMP

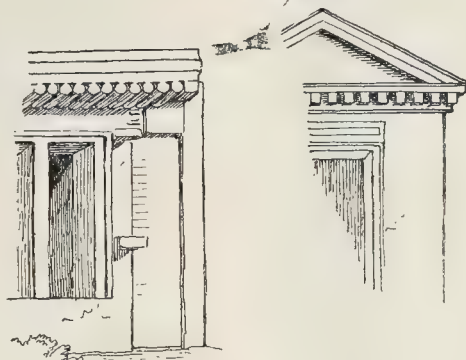


"Origin and Use of Ornament."—5.

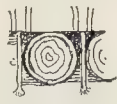
For the most beautiful ornamental use of animals combined with floral pattern we can have no finer masters than the Persians, and no finer instances of decorative combination and treatment than the finest kinds of Persian carpets, such as we are fortunate enough to possess at South Kensington Museum. It seems hardly possible that refinement and elegance, and graceful and romantic invention could further go than in such works as these; and their peculiar beauty is owing to the perfect unity of design and material—affording fresh instances of the complete harmony and inseparability in the finest decorative work of use and ornament, and of the most perfect use of ornament.

The ornamental value of animal forms is obvious when treated with such refinement and skill. They give life, movement, and mystery. They enable the designer to pleasantly break and vary the field of pattern

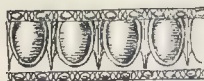
### IMITATIVE ORIGINS CONTO ARCHITECTURAL



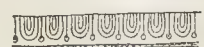
ROCK TOMBS ANTIPHELLUS LYCIA



SUGGESTED ORIGIN



ECHINUS PATTERN ERECHTHEUM



ECHINUS PATTERN SAMIAN VASE

"Origin and Use of Ornament."—6.

with varied masses which could not be obtained in any other way. Not that I suppose the Persian designer consciously thought of them in this dry technical way. He was determined to enjoy himself and bring in all the exciting things the Persian mind loved to see, and probably only thought that when the carpet was woven and spread what a fair flowery Paradise, peopled with noble beasts for the hunter, he could suggest; and his unerring instinct, perfected by centuries of living tradition, enabled him to do so in a way that, I fear, will need some other inspiration than the technical school can supply for us to get within measurable distance of.

Yet why should not our designers be English in the same way that these were Persian? Why not put the things we love in our designs, and not try to imitate Greeks or Romans, or modern French, or anybody else? Are there any fairer things than English flower-gardens and English woods and meadows in the spring, or those green carpets peopled with spotted deer?

I have alluded to the symbolic origin of ornament, a symbolism, which, narrowed and specialized—domesticated, as it were—still survives in heraldry, the earlier beauty and spirit of which was probably owing to the necessity of decorative frankness and emphasis—the necessity of legibility, in fact—which still rules as a primal requirement in the design and colour arrangements of flags and banners.

Another important characteristic in ancient and Mediaeval ornament was its narrative capacity. In the days when ornament was taken seriously, when books were few, and only read by priests and scholars, decorative and pictorial art were then united in ornament, and, in this form, filled the place of books for the many. Its clear language of colour and line spoke from the walls of the churches and public buildings, embodying the most cherished articles of faith, and the legends dear to the heart of the race, the people, the country—after all, perhaps, the most public form of public library; a living and visible vernacular, for which one would

cheerfully exchange not a few newspapers and penny dreadfuls.

Under an industrial system, the object of which is not to produce things of beauty and joy for ever, but chiefly something that will sell—a system under which all labour has been differentiated and finally dominated by machine production—it is not surprising that the industrial right-hand should not always know or understand what the ornamental left-hand is doing—or *vice versa*; while the ceaseless progress of mechanical invention (where the real invention and interest of the age is to be found) constantly, by the introduction of new methods, tends to outstrip artistic or ornamental invention, power of assimilation, or adaptability with which, nevertheless, mechanical invention ever seeks to unite itself—nay, is compelled in some way so to do, to make its results available and attractive to humanity. Thus quite a new use for ornament has been discovered in modern manufacture and trade. The utilitarian cannot afford to ask, "What is the use of ornament?" For ornament covers a multitude of sins. It makes goods saleable. It gives smartness to the cheap, and compels the poor material to look winsome and gay. Ornament can be persuasive in a thousand little ways—commercial in short. But then it ceases to be ornament and becomes a commodity.

Yet everything is ornamented now. Furniture is cut, carved, chamfered, inlaid, brass-mounted, gilded, painted, French polished within an inch of its life. Everything cries out, as from the shop window, "Look at me!" as if it were a mirror—as indeed it is of the taste (or necessity) of its maker, seller, and buyer.

Alphabets, Grammars, Dictionaries, Hand-books of Ornament increase and multiply. We may study samples of all the ornament that was ever devised by restless man in our museums. We have, ornamentally speaking, been everywhere and seen everything. What wonder that with such masses of material to be assimilated, we sometimes see symptoms of ornamental indigestion?

Thought, refinement, taste, or true feeling,



selection, invention, and artistic insight generally cannot be forced or crammed. They cannot be administered by the spoonful, or the mind filled up from without. These things are a growth of the mind, only gradually evolved, and by no means capable of being produced to order—"while you wait."

We are going to technically educate our industrial armies to ornament us properly, within and without. It almost seems as if we shall have to seriously consider the advisability of revising the art of tattooing (an art or craft not shown at the recent exhibition) to furnish sufficient employment for the coming ornamentalists, under existing industrial conditions.

No doubt if use is first thought of by the designer—the conditions, materials, limitations, which go to the making of anything for the service of man (whether ornament is a primary, secondary, or ultimate object), we are more likely to get something good. Our technical schools can at all events demonstrate the conditions which designers of ornament must satisfy, even if they cannot inspire them with fresh ornamental motives; but we may get, as we often do, a pattern—for a woven or printed textile, let us say—which entirely meets manufacturing technical conditions, yet which fails to arouse any emotion whatever, or only, perhaps, evokes the wish that the material had been left plain. Whereas, on the other hand, a thing—say a desk or a seat, perfectly adapted to human requirements—may be so gracefully formed and cunningly planned as to leave no desire for actual or added ornament. This goes to show how much, after all, if not the best part of artistic invention and craftsmanship, may not be put into the planning and making of a thing—that is to say, the purely useful and constructive side, if always controlled by the sense of beauty—a sense which may govern the smallest detail of construction, as well as the most delicate surface ornamentation.

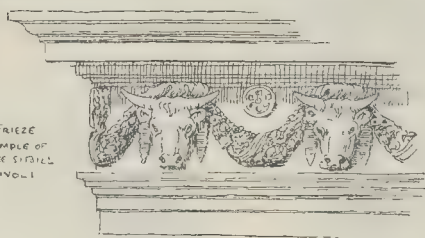
So that, according to this view, beauty is not only "skin deep."

We might, indeed, define the ornamental sense as the constructive sense dominated by the sense of beauty.

The ornamentalist is now, however, chiefly concerned with the structure of surfaces, since ornament has now what may be fairly called an independent existence. It is designed by specialists quite apart from the actual fashioner and manufacturer of the objects and materials ornamented. Every species of floral growth, every style, every period, everything under the sun, one might say, have their counterparts in ornamental design. It is a distinct language of expression in art. Whole schools and styles of ornament, like the luxuriant efflorescence of summer, have grown up, have fascinated us, and have passed to decay.

But throughout all its changes and phases of development there is traceable the recurring tendency to return to its first principles of structural suggestion and control. Ornament never seems able to sustain vigorous and healthy life and invention if it becomes inorganic—that is, unrelated to architecture, to construction, and the modifications of method, tools, and materials. The finest forms of ornament remain those which acknowledge a structural basis. We cannot, I think, therefore, in studying the true and beautiful use of ornament, dwell too much on this necessity, which justifies a real preference for the organic types, rather than the inorganic and unrelated types, whatever accidental charm they may sometimes possess, for the one means vitality and growth, and the other decadence and decomposition.

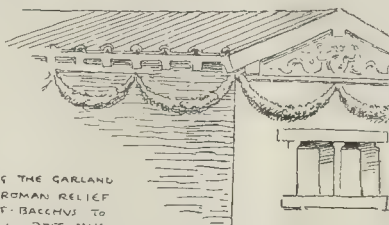
If we go on tolerating ugliness—brutal outrages on the eyesight—whether in the solid form of iron or brick monstrosities, or in that of the ephemeral but omnipresent poster (especially when it flaunts in the green fields) we shall be in danger of losing our eyesight altogether, so far as it is concerned with the perception and production



FRIEZE  
TEMPLE OF  
THE EMPEROR  
TIVOLI



YOKES OF OXEN CARRARA



HANGING THE GARLAND  
GRÆCO-ROMAN RELIEF  
VICT OF BACCHUS TO  
"ICARUS" BRIT. MUS.



"Origin and Use of Ornament." 7.

of beauty. The worst of it is that there are so many apparently conflicting ideas about as to what is beautiful, though there is a beauty which is universally acknowledged in the long run.

Some confusion may arise from the differences between conception and execution—selection and treatment. We often see a good motive poorly carried out, and, still oftener, perhaps, a bad or ugly motive worked out with wonderful skill and force.

It is not the mere presence or absence of ornament that settles the matter. A work, a picture, or piece of furniture may be beautiful either with or without ornament; or it may be ugly both in the lack of ornament or with its excess. The very excess of ornament may be due to the feeling that we cannot have too much of a good thing—a fatal mistake, of course.

If moderns are fond of external beauty in anything like the same degree as the ancients and Mediaeval people were, they must be so fond of it that they cannot help gobbling it up whenever they find it. That, at least, would account for its scarcity. Jaded with the mass of ornament (as she is generally understood) one is apt to turn with a sense of relief to simple structure and plain surfaces to primitive and artless designs. Some of us are ready to declare that we would rather have a trestle table and a carpenter-made settle than all the Ormolu and Buhl in the world.

A distinguished member of the Arts and Crafts Exhibition Society, remarkable for the intricacy of his own work in ornament, has

painted the interior of his own house plain white, quite regardless of the possibility that if his example were to be extensively followed wall-paper designers and stainers would soon be unemployed!

I remember when cloth book covers used to have one side brave with gilt device and legend, but the other was what was called "blind." It often seems to me men's minds are like this kind of book cover. A certain alternation of mood must be allowed for, and the designer must have his daytime as well as his night-time like other people. The great need of our time seems to me to be this—what I should call a want of margin, for rest, reflection, recuperation, and, I think, sooner or later, like "The Living Wage," it will have to be won for all of us, and then I doubt not that our creed of ornament will improve, as well as the aspects of life in general, since, until we have learned how to live, and what use to make of our lives, how shall we know how to adorn them, as we have seen that ornament cannot be divorced from construction? WALTER CRANE.

LETTER FROM PARIS.—Owing to the space occupied this week by special articles and engravings, we are compelled to hold over till next week our usual monthly "Letter from Paris."

PARTNERSHIP.—Mr. W. E. Baker and Mr. F. S. Ham, formerly connected with the well-known firm of Messrs. J. Stone & Co., of Deptford, have resigned their appointment and commenced business as manufacturers of fittings for water supply and sewerage, under the style of Ham, Baker, & Co., municipal engineering works, 13, Grosvenor-road, Westminster.



## NOTES.

**T**HE scientific and sanitary dispositions of the Seventh International Congress of Hygiene and Demography, held in London, seem but as yesterday, but we are reminded of the lapse of time by the fact that the Eighth Congress, to be held at Budapest in September of this year, is in active preparation. A circular from Dr. Coloman Müller, the general secretary to the Congress, informs us that the executive committee have now finally arranged the time and order of transactions of the Congress. The preliminary meeting of members will take place on September 1, the formal opening on the 2nd, the sectional meetings on the 3rd, 4th, 5th, 7th, and 8th, and the general closing meeting on the 9th (Sunday). September 6 is to be set apart as a day for repose, and for excursions or visits to places of interest. The programme of questions to be treated has been sent out, and it is stated that so many promises of communications have been received from eminent scientists, that the success of the Congress is already assured. A Hygienic Exhibition is being arranged from which it is stated that all "trade element" will be excluded; a promise often made on occasions of this kind, and not often kept. There is to be an important discussion on diphtheria, in regard to which special efforts are being made to render this an important and exhaustive treatment of the subject. This is a matter of interest to architects and sanitary engineers as well as to doctors, considering the close connexion which is admitted to exist between diphtheria and drainage. English architects who may wish to attend the Congress will find themselves in the way of other attractions besides sanitary ones; the town itself is a fine one, and an expedition to Belgrade and Constantinople is being arranged for, to take place after the close of the serious business of the Congress.

**W**E meet with many reminders that Manchester has now become a harbour and port, apart from the official declaration, and the *Gazette* notice that the County Court of Lancashire held at that city "will henceforth have Admiralty jurisdiction." In *Bradshaw's* January steamer list, for instance, the new port figures for the first time, notice being given of services between Manchester and Glasgow, Aberdeen, Leith, and Dundee, while the General Steam Navigation Company are arranging a weekly service to Rotterdam and Amsterdam. It has been pointed out that the opening of the Liverpool and Manchester Railway over sixty years ago was at that time looked upon as practically making a seaport of Manchester, a letter written in December, 1829, prophesying the "ruin of half the warehouses in Liverpool" through the facilities thus afforded for the marvellously rapid transit of merchandise to the inland town. Last Monday's proceedings were witnessed by an immense throng of sight-seers, many of whom were interested in a very literal sense; indeed, there were probably very few among the thousands who took part in or witnessed the triumphant procession along the Canal, who will not be affected in a greater or lesser degree by the success attending the venture. It is worthy of remark here that, prominent among the craft "on view" on Monday, was a boat loaded with granite setts from the Welsh quarries for the Manchester Corporation.

**W**E have but lately alluded to the great activity of the Public Works Offices at Berne, where the chiefs of the Federal and the Cantonal Building Departments seem to imitate the example set by the energetic City Architect, Herr Hodler. The chief event in the building annals of Berne for 1893 was the completion of its new National Museum. In the present year several important works are to be commenced; the new Federal Council Hall in

the first place. Had it not been for a certain amount of opposition, headed in this case, however, by Herr Hodler, the building annals of the coming year would have been far more remarkable than even the commencement of some new Houses of Parliament would have made them, for Berne was to have led the way with the erection of a large public building devoted entirely to the administrative offices of the various trades unions and the halls necessary for the different meetings organised by these societies. The erection of such a democratic institution with the moneys of a public purse would, indeed, have been an event, especially as we hear that this Utopian improvement on the public-house and the rented assembly-room was to cost the ratepayers about 750,000 francs, or 30,000*l.* Though barred for the coming year, it is, however, very probable that this scheme will soon be again brought forward, especially if the proposed General Assembly Hall and Art Galleries are not soon taken in hand. It may hence be interesting to hear that the proposed new home of the trade unions was to have one meeting hall for an audience of fifteen hundred, and four others with room for audiences of three hundred each. There was to be a Free Library and Reading-room in the block, and last, but not least, besides the many offices, a "labour bureau" and a soup kitchen and extensive dining-halls.

**A** CORRESPONDENT writes to complain of the great inconvenience to which persons seeking for houses in London are put by the unbusiness-like ways of house-agents. One complaint is that a would-be tenant is constantly supplied with orders to view houses which are already let, by which time and money are wasted. This muddle arises, to some extent, from the fact that it is customary in London to place houses in the hands of several agents, and the house-owner frequently does not take the trouble to communicate with the unsuccessful agents when a house is let or sold. But there can be no doubt that house-agents should be more careful in the supervision of their lists. Another grievance is that the size of houses and the conditions of a tenancy are not accurately stated by the agent. Thus a tenant asks for a list of houses containing, say, eight bedrooms; perhaps the very first house he visits is found to contain only six of the required rooms. The fact that houses are, in London, placed in the hands of too many agents is really at the bottom of it all. If one agent only has a house to dispose of he will attend carefully to the business; if he knows that it is in the hands of half-a-dozen other firms he becomes little more than an advertising medium. If the leading firms would make it a condition of their business that when a house is placed in the hands of any one of them it is not to be put on the books of another firm, it would, in the long run, be to the advantage of all concerned.

**H**AVING widened their Cannon-street bridge in 1892, and that at Charing Cross four years previously, the South Eastern Railway Company have nearly completed a corresponding enlargement—rendered necessary by increasing traffic—of their station at London Bridge. The new works have been carried out under the superintendence of the Company's Engineer, Mr. Brady. They comprise the addition of two lines (making seven in all), widening and lengthening of the platforms, building of new waiting-rooms, roofs and sheds, and rebuilding of the front booking-offices. Space for the extension was taken along Tooley-street, southwards of which the station had been built to serve their traffic when extended to cross the Thames. The inconvenient inclines for passengers and luggage to and from the platforms are replaced by an iron bridge and a passage below. For some time the original terminus, since converted for purposes of the goods traffic, was used in common by the South-Eastern and London, Brighton and

South Coast Companies. The line to Red Hill and Tunbridge was opened in May, 1843, and carried on to Dover two years later; the Greenwich line, the first that was made to run out of London, had already been constructed by Colonel Landmann, engineer. In his lecture upon "Some Celebrated Timber Roofs," delivered at Carpenters' Hall on April 1, 1885,\* Professor Roger Smith pointed out faults in the design of the queen-post roof, 92-ft. span, of that terminus, indicating the defects, he says:—

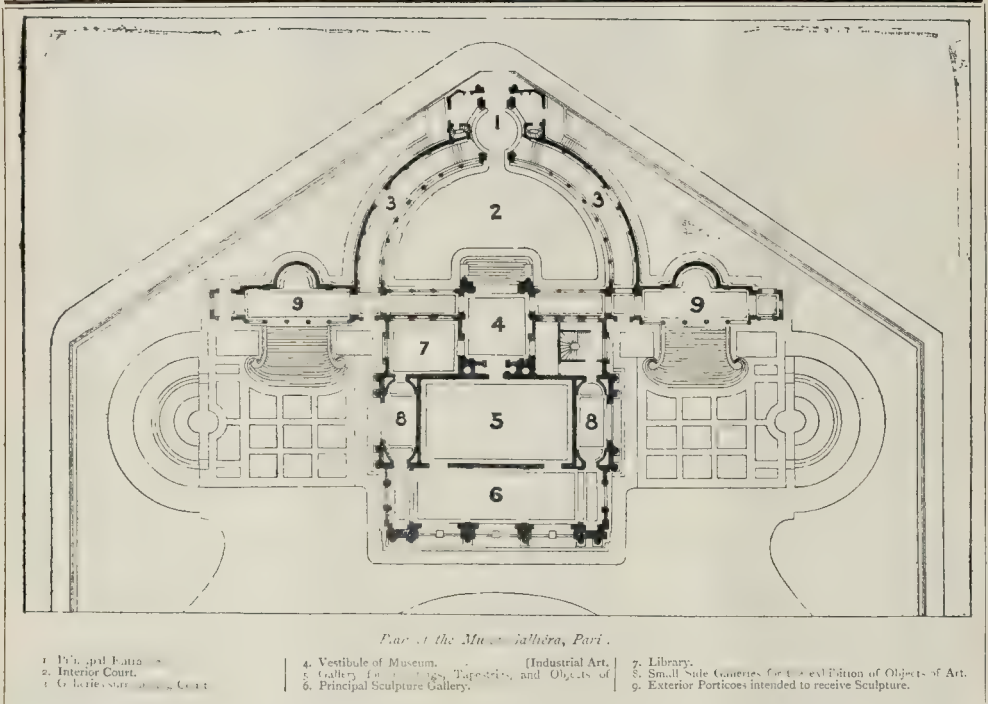
"There is no reason to be surprised at the failure of this roof; and yet its appearance is striking, and gives the idea of its being both skilfully, skilfully, and boldly designed. Boldness has, however, been pushed too far."

The Greenwich railway is remarkable for its viaduct of nearly 900 brick arches; at the outset they laid the rails upon spaced blocks of stone, but soon replaced these with timber sleepers. The alterations effected by the Great Eastern Company in Bishopsgate-Without during two years past are upon a much larger scale, and in the end will give them a terminus at Liverpool-street covering fifteen acres. Here for the new site they have excavated 130,000 cubic yards; they have built three iron bridges, laid eight new lines with platforms, and erected a new parcels' office, four stories high. A leading feature will be the "circulating area," at end of the platforms, measuring 90 ft. by 210 ft., and roofed in one span. The number of lines is raised to twenty: the combined fronts of the old and new stations extend over 500 ft. We understand that the works are planned and designed by Mr. J. Wilson, the Company's Engineer-in-Chief. By a coincidence, each of the two stations covers the first site of an ancient hospital, this being on the site of Bethlehem, founded in 1246 by Simon Fitz-Mary for a priory, and given by Henry VIII. to the City of London, the other supplants the gardens and nearly all the buildings of St. Thomas's, originally an hospitium (1209), dedicated to a Becket, belonging to the prior and canons of St. Mary Overie. In the Ashburnham MSS., British Museum, is a charter of 1214, whereby John and Grace Chalonor quit-claim a messuage in Southwark to Amicus [warden of an adjacent hospital founded by the Bermondsey monks] for the new [united] hospital of St. Thomas the Martyr for ever.

**T**HE unusual space occupied by special subjects this week in our columns has left us no opportunity for any detailed article on the two interesting loan exhibitions at Burlington House and the New Gallery, and we must defer special notice of them till next week. We may say for the present that the Burlington House "Old Masters" exhibition continues to keep up its interest in the most remarkable manner, though we observe that, as was to be expected, some of the works which were exhibited nearly a quarter of a century ago to a younger generation are beginning to re-appear. We hope this resurrection of the treasures of past exhibitions will be carried much further; there were many splendid works in the earlier loan exhibitions which have never been seen by a large portion of the public who now visit the galleries, and which have very likely changed owners in the meantime. The special features of the exhibition are the interesting collection of the paintings and designs of Stohard, in the Water-Colour Room, and a selection of the works of the late Mr. Pettie in another room; also a series of drawings by Blake for his finest work, the illustrations to the Book of Job. At the New Gallery the majority of the paintings are of more interest historically than artistically, but, on the other hand there is a remarkable collection

\* For report see the *Builder* of April 4, 1886.

† The late Dr. Kenelm mentions many inhabitants of the Close, such as the Howes, Willingtons, and Nicolson, natives of Holland, and glass painters. Galyon Hoone and James Nicolson, with Richard Bowdell and Thomas Reeve, contracted to make eighteen windows for King's College Chapel, Cambridge, and to supply designs for four to Francis William and Symon Symondes (1506).



of Italian decorative work in the shape of bronzes, ivories, gold-work, &c., which is well worth attention.

THE "furniture middleman" appears to be preparing a grand display at the Agricultural Hall, for April, of "Art Furniture and Decoration," concerning which we are told in the circular that "it will be a *bona-fide* trade show," and "the general public will not be admitted;" admission is to be only by tickets, which will be distributed to the right people. The reason of this last restriction we do not understand. Is it to avoid disagreeable criticism, or to guard against the purloining of trade secrets? Another thing that we do not see is where the "art" comes in. In the Arts and Crafts Exhibitions we have seen collections of articles exhibited (for the most part) in the names of the persons who designed and made them. The "Arts and Crafts" is somewhat circumscribed in its sympathies; it is possible that there may be some work in other styles, and which merits the name of art, found in the promised exhibition at the Agricultural Hall. But nothing is said about the designers—the real craftsmen. It is, apparently, to be an exhibition for the honour, not of those who design and make furniture but only of those who sell it.

**PARTNERSHIP AND CHANGE OF ADDRESS.**  
Mr. Jeremiah Head, consulting engineer in civil, mechanical, and metallurgical engineering, has removed his headquarters from Middlesbrough to 47, Victoria-street, Westminster, and has taken into partnership his son, Mr. Arnold Potter Head, the firm being now Jeremiah Head & Son.

**SILICATED GRANITE CONCRETE FLAGS.**—Messrs. J. Van Praagh & Co. of London, have been appointed sole agents for London and adjoining district for the above-named and other materials manufactured by the Glass, Granite, and Patent Concrete Company. These consist, we believe, of a mixture of cement with a crushed granite, or rather syenitic hornblende, for it is not a true granite, though a very good material for the purpose.

**PATENTS.**—The applications for the grant of British patents for inventions have been more numerous in the past year than in any previous year, the number being 25,202.

## Illustrations.

### THE MUSÉE GALLIÉRA, PARIS.

THIS new museum, of which some account has been already given in our report of the Proceedings of the Congress of French Architects of 1892, is now nearly completed. The interior fittings will shortly be finished, and the Municipality of Paris will then be able to instal in the Museum the purchases of works of art which it makes year by year.

The monument has been built at the expense of the Duchesse de Galliera, on a site which she has presented to the Municipality, and is from the plans and designs of M. Léon Ginain, architect and member of the Institute of France. The interior decoration has been executed by M. Compagnon, after the sketches of the architect, and the sculptural portion of the work has been entrusted to MM. Chapu, Cavelier, and Jules Thomas, who have executed the three statues in the bays of the principal façade, representing Painting, Architecture, and Sculpture.\* The bust of the generous donor is to be placed in a space provided for it in the entrance vestibule.

The museum will not offer very large wall-space for paintings, which may be considered from one point of view a wholesome circumstance, as it will necessitate a cautious and severe judgment in the purchase of pictures. There is, however, room for a great deal of sculpture in the large gallery looking on the square, and in the two porticoes. The two exedrae in the gardens on each side will also be available as portions for sculpture.

The plan has unfortunately been sent to us from Paris without a scale, but the reader may estimate the scale approximately from the fact that the gallery No. 5 is just 20 metres, or 65'6" in length.

Both in plan and design this building seems a model of what a museum of art should be—an artistic shrine for works of art, not a mere roof to cover them, and it affords a peculiarly happy example of the application of classical forms to modern architecture.

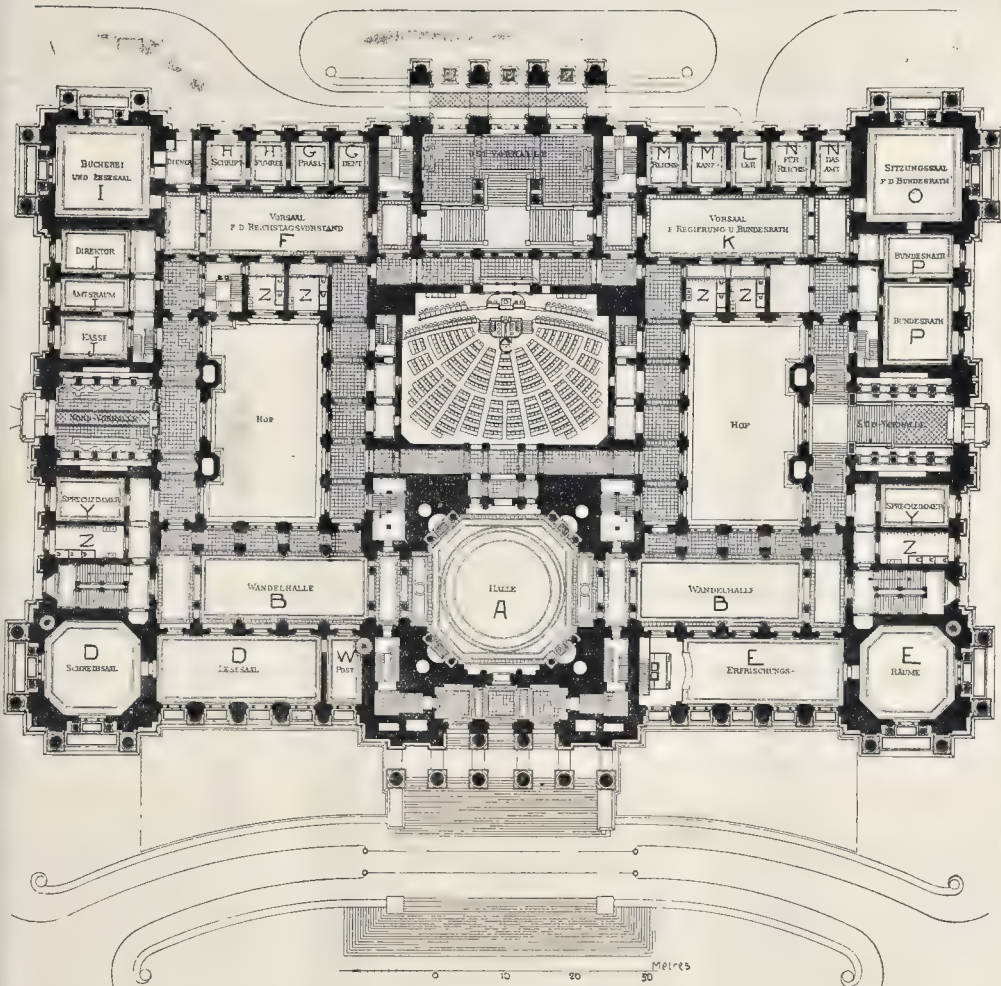
\* We had hoped to have given large scale illustrations of these figures, as an appropriate accompaniment to the view of the building, and they were actually photographed with that object in view, but unfortunately the faces had already become so much discoloured by the effect of heavy rain that we were obliged to omit them, the result was to leave the figures looking like mere outlines.

### ON NO MAN'S LAND.

SOME of the towns and villages upon the banks of the Main have their Rathhouses erected upon most singular sites. That of Dettelbach, which has been previously illustrated in *The Builder*, stands upon an arch spanning a stream, and has the principal street of the town passing beneath it at right-angles to the river. The Rathhaus at Marktbreit stands upon a bridge thrown across the city moat, and has a street passing beneath it. The Rathhaus at Bamberg has a still more remarkable site, as it is built upon the bed of the river, and tradition asserts that this singular site was selected because the Town Council, being on bad terms with the Prince Bishop, who held one bank of the river, and the nobleman who possessed the other bank, could obtain no land whereon to build the Rathhaus, so they erected it upon the river's bed, that being regarded as "no man's land." Whether the tradition is true or not we have been unable to ascertain, but the singularity of the site selected has not been explained by any other theory.

Unfortunately the Bamberg Rathhaus was entirely rebuilt at the close of the seventeenth century, the present building is consequently in the Late Renaissance style, covered externally with somewhat rank paintings in distemper. The general effect is not unpicturesque, but there is nothing about it to account for its strange situation. In the old view of Bamberg, given in the *Nuremberg Chronicle*, a building that seems intended for the Rathhaus, has projecting parapets and corbelled-out turrets at the angles; in other words, it is a fortified structure, which is somewhat strange, because the town itself was never either fortified or walled round, an omission which is accounted for, it is said, by the fact that Bamberg was regarded as a sacred city from the great relic of the true cross deposited in the Cathedral by the Emperor and Empress, St. Henry and St. Cunigunda, who are buried in the Cathedral; and now comes a question—Is it not possible (supposing this fortified building shown in the *Nuremberg Chronicle* to have been the Rathhaus) that it may have been erected on the bed of the river for the sake of its protection? because, although possibly the warlike barons of the Middle Ages may have scrupled at robbing a church protected by so sacred a Palladium, yet they may not have considered that this protection extended to the treasure-chest of the town council. However, although we venture to suggest this





The Imperial Parliament House, Berlin.—Plan of Ground Floor.

- |                                 |                           |                                  |                                 |                    |
|---------------------------------|---------------------------|----------------------------------|---------------------------------|--------------------|
| A. Central Hall.                | F. Speaker's Lobby.       | K. Ministerial Lobby.            | P. Committee Room (Bundesrath). | W. Post Office.    |
| B. Main Lobby.                  | G. Speaker's Study.       | L. Ante-room.                    | .....                           | X. Servants' Room. |
| C. Council Chamber (Reichstag). | H. Secretary's Office.    | M. Chancellor's Rooms.           | .....                           | Y. Private Room.   |
| D. Writing and Reading Rooms.   | I. Speaker's Library.     | N. Offices.                      | .....                           | Z. Lavatories.     |
| E. Refreshment Rooms.           | J. Administrative Office. | O. Council Chamber (Bundesrath). | .....                           |                    |

explanation, we must acknowledge that it does not meet one objection, and that is, it completely fails to account for the almost equally singular site in such towns as Dettelbach and Marktbreit, which were fortified, and could not claim immunity from siege and sacking on account of any unusual sacredness.

Our illustration represents a town-hall erected on a similar site to that at Bamberg. It is, however, purely an imaginary design, and is not founded upon any existing building, or any structure of former times. The site being the centre of the river, the general outline has been treated in such a way as to bear some resemblance to a ship with its lofty poop rearing itself out of the water. As at Bamberg, the approach is from the centre of the bridge, and the building has an open loggia round the upper story, a feature very common in the Medieval Rathhouses of Germany, good examples of which are to be seen at Brunswick and Hildesheim.

H. W. B.

#### VIEW AND PLAN OF WESTMINSTER ABBEY.

THE view of Westminster Abbey, specially drawn for this issue of the *Builder* by Mr. John Begg, is taken from the north-east, so as to get

the most interesting and picturesque portion of the exterior architecture into the foreground. To get this view a little liberty has been taken with the position of St. Margaret's Church, which, in its actual position closer up to the Abbey, would have shut out the north transept from this point of view, and its angle is therefore shown as a little further from the great church than is actually the case. As the object is to show the Abbey rather than its surroundings, this was the only way to meet the case.

The plan is drawn by Mr. K. W. Paul on the basis of a plan made by Mr. R. Phené Spiers, which he has kindly lent us for the purpose, and from which this one has been prepared, with reference at the same time to the actual building. In the shadings showing the different dates we have followed a coloured plan prepared by Mr. J. T. Micklethwaite, who has made the history of the Abbey buildings a special study.

For further remarks on the subject of this great building the reader is referred to the first article in this issue.\*

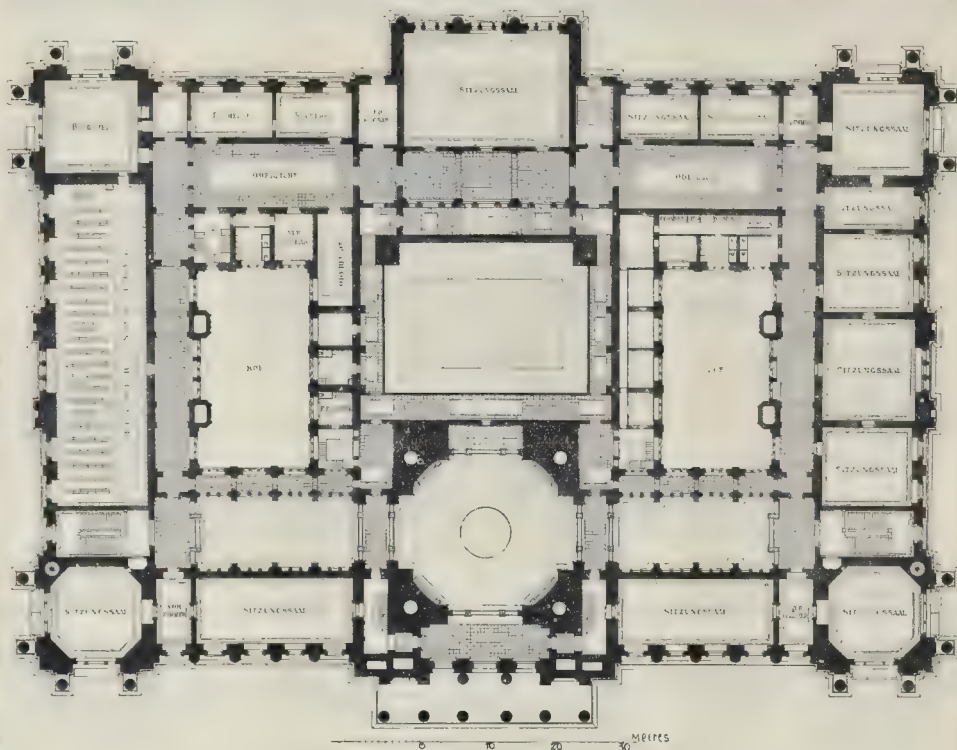
\* The view and plan of Westminster Abbey forms No. 1 in a series of illustrations of The Ancient Abbeys of Great Britain, which will be resumed and continued month by month as soon as the publication of the illustrations of the "Ancient Cathedrals of Ireland" is completed.

#### IMPERIAL HOUSES OF PARLIAMENT, BERLIN.

THE new building for the Imperial Houses of Parliament at Berlin is the outcome of two competitions, of which the first in 1872 (won by Herr Bohnstedt) numbered one hundred and two designs; and the second, of 1882, no less than one hundred and ninety-four. The latter competition was remarkable for its excellent management and the amount of the premiums, including two of 750l. each, three of 500l., five of 150l., and ten minor ones. The two first premiums were given to Herr Paul Wallot, of Frankfort, and Professor Thiersch, of Munich, respectively, and the former architect (who has since been made an "Imperial Crown Surveyor") eventually received instructions to revise his plans and carry out the building.

The ceremony of laying the foundation-stone of the New Houses of Parliament in June, 1884, was the occasion of one of the most imposing spectacles the German capital has seen. Since then the works have been progressing at various degrees of speed, greatly hampered at times by the frequent alterations proposed by the Special Committee appointed to watch over the building, and also sometimes by the impossibility of rapidly obtaining the large quantities of materials required.





Imperial House of Parliament, Berlin. Plan of Upper Floor.

Twenty-one million marks, or about 1,050,000*l.*, will have been spent on the building by the end of the year, when it will be ready for use, though by no means complete. Several million marks and quite five years will still be required to finish the sculptural and fresco decoration intended for the interior of the building, so that all-in-all the New Houses of Parliament will probably not be quite completed until the beginning of the next century, after costing Germany about 1,250,000*l.* and taking about fifteen years to erect.

The site of the new "Reichstagshaus," as it is called, is on the Königsplatz, a fine square, flanked by the Tiergarten on the one side and the river Spree on the other. The building is open on all sides. Its main front to the Königsplatz, looking due east, faces the Column of Victory, so that what with the Headquarters of the General Staff, and the historical Brandenburg Gate, close by, the associations of the site, and its own essentially military and heraldic decoration, the ensemble strikes the visitor as being rather decisively warlike.

The photographs we reproduce are taken from the model of the building which was sent to the Chicago Exhibition. From this reproduction, as well as from the detail elevation of the central portion of the east front, which is also given, some opinion can be formed of the appearance of the Reichstag's new home, and it would here be well to point out that throughout the course of erection the architect has been able to decide on his detail with the aid of plaster models to an extent quite unknown in this country. Besides the models of the complete building in scales varying from one-eighth of an inch to a foot, to a quarter of an inch and half an inch, scale, practically every part of the building has been modelled in one-tenth and one-fifth full size, and nearly every individual detail in full size. These models were made by expert architectural sculptors of the first order, who were aided in the more artistic work by such artists of standing as Professor Lessing and a number of junior sculptors of repute. The façades are essentially typical as examples of the feeling of the modern German school and, as such, though not as successful as the courtyard façades and the interior, certainly please the German

general public. German experts, it is true, find fault with the principle of having a stately columnier treatment where there are several stories, and also with the fact of the cupola being entirely of iron and glass. If, however, they were to look into the history of the design, which had to be kept as a whole like the one premiated at the competition (though, for instance, two stories were turned into three and other important changes made), they will give the architect his due for having surmounted his many difficulties with unusual skill. The older German architects consider the sculptural decoration on the façades essentially coarse and too redundant, but both these defects are again typical ones of the school to which Herr Wallot belongs, or may even be said to have created, and are quite in accordance with the characteristics of the city in which the building stands and the people that will use it.

Referring to the plan, it is only fair to at once explain that it was originally intended to have the most important rooms on a much higher level than has actually been taken; that the position of the large Council Chamber had to be several times changed, and with it the position of the long *salle des pas perdus*, or lobbies. Further, among the many difficulties which beset Herr Wallot we may mention that the committee actually made the position of the cupola a point for discussion when the building was in an advanced stage, and that their decision not to let it cover the central hall, as at the time intended, but the Council Chamber, as first suggested by the architect in his competition drawings, eventually led to some of the irrationalities we see when comparing the plans and elevations.

The main entrance to the building from the Königsplatz is approached by an incline and a flight of steps which lead directly on to the main floor. The entrances from the back and sides are, on the other hand, on the level of the street, and the main floor is here reached by flights of stairs off the respective vestibules. The entrance on the north and south sides will probably play the rôle of our St. Stephen's entrance to the House of Commons, whilst the entrance from the rear is reserved for the Emperor, the Upper House (Bundestag), the Ministers, and the Speaker.

Only the north and south entrances are properly provided with cloak-room accommodation; the main entrance has no accommodation of this kind whatever.

The plan of the main floor practically explains itself, and we only note that the amount of space devoted to lobbies and passages seems remarkably large. The main lobbies, with the central hall, have a length of nearly 100 metres (328 ft.), the span of the hall being 24 metres, or 78 ft. The Speaker's and the Ministers' lobby measure 95 ft. by 29 ft. 6 in. respectively, and the vestibule at the rear 78 ft. by 52 ft.

The great Council Chamber, which is lighted from above, measures 95 ft. by 69 ft.; the small Council Chamber, for the "Bundesrath," 42 ft. 7 in. by 42 ft. 7 in. The reading-rooms and refreshment-rooms, off the main lobbies, are exceedingly roomy, whilst lavatory accommodation is somewhat limited. The plan of this floor will, it is thought at Berlin, answer its purpose well, though we can scarcely understand the absence of comfort for the individual Member of Parliament, and doubt if many parts of it would be sufficiently lighted.

Passing an entresol which faces part of the rear and sides only, and contains the galleries to the large Council Chamber and a great deal of press, office, and storage accommodation, the second main floor is reached. This floor is practically entirely devoted to committee-rooms, of which there are twelve, with dimensions ranging from 82 ft. by 55 ft. 9 in. and 15 ft. 6 in. by 32 ft. 9 in. for the largest, to 39 ft. 4 in. by 23 ft. for the smallest. The north side, however, contains a spacious library, measuring about 164 ft. by 78 ft., which is to be used for reference purposes, and in connexion with it there is a librarian's office, work-room, etc.

The ground-floor, if it can be so called, is essentially for the administrative part of the building, though there are also two committee-rooms on this level. The official shorthand writers, the usher's offices, the printing-press, the kitchens, the police, fire-brigade, and post-offices have been found room for, and there is also a spacious strong-room. The entrance to the public galleries also has its own lobby, measuring 92 ft.

by 42 ft. 8 in., off the north entrance on this floor, and there is likewise a small press lobby on this level.

All the machinery necessary for the Reichstag, has fortunately been given a building of its own on a site a couple of hundred yards away.

Returning to the elevations of the building, we would only add that a Silesian sandstone has been used for the most part, the plinth alone being of granite, whilst the sculpture is of a finer freestone. The cupola, with its copper and glass surfaces, has been highly gilded; the windows towards the front are of plate-glass. It would lead too far to describe the many statues and groups on the fronts, which are for the most part symbolical or historical, but we may mention that among the sculptors of repute engaged on the building were Reinhold Begas, Professor Schaper, Lessing, and Wiedemann.

In accordance with the German custom we may mention also that Herr Wallot's chief architectural assistants were Messrs. Fischer, Halmhuder, Pfann, Rieth, and Schmalz, whose names have constantly recurred in our columns as the winners of some of the most important German competitions of the last decade.

The system of heating and ventilation employed was described at considerable length, and illustrated by plans, in the *Builder* for January 17, 1885.

#### DESIGN FOR A PROVINCIAL TOWN HALL.

THIS is the design which gained for its author, Mr. James S. Stewart, the Royal Academy Gold Medal for architecture for 1893, and the Travelling Studentship. We give the principal elevation and two plans.

The conditions issued by the Academy for this competition gave no information beyond the size of the site and the drawings required; the amount of accommodation, &c., being left to the discretion of the competitors.

The author of this design has endeavoured to arrange the various departments as distinctly as possible, so that any one of them could be shut off when not in use.

The treatment of the elevations is based on late seventeenth-century English Renaissance.

#### DUNKELD CATHEDRAL.

ON the site of the present Cathedral stood formerly a Culdee Abbey, but not even the record of its dimensions is preserved; a portion indeed of its wall is said to be incorporated with the east gable, but the mere presence there of some differently coloured stones is not very convincing evidence. The settlement dated back to the ninth century, possibly earlier. In 844 the remains of St. Columba were removed from Iona and here reinterred—though carried finally to Ireland—hence the dedication of the church to that saint. Dunkeld then became the seat of the Scottish Church primacy, and continued to be so till the transference of the dignity to St. Andrews. In 1127 the rule of the Keledei was superseded by the territorial episcopacy inaugurated by David I. Many bishops there had been before that time, but no special district was assigned to each; now the country was divided into dioceses, and to Dunkeld, Gregory, the last abbot of the old order, was installed as Bishop, retaining at the same time his original dignity. Some of his predecessors had held a like plurality of offices; the very first Abbot of Dun-cailen was also Bishop of Pictland and had precedence of all others in that district, while another instance of the occasional combination of offices occurred in the person of Ethelred, younger son of Malcolm III., at once Abbot of Dunkeld and Earl of Rife. That occurred towards the close of the eleventh century, when the Abbey became an appanage of the Crown, illustrating the secularising process then general so far as affected the heads of the great religious houses throughout the land, a tendency successfully reformed by David. There was also Irish precedent for such combination of office as a king being at the same time bishop, and king and abbot.

The Cathedral Church of St. Columba now consists of a long choir in four bays, without



aisles, and never vaulted: on its north side is a lofty, square Chapter House, vaulted, above which is a charter-room. The nave is on the same level as the choir and is of seven bays with side aisles—the south one alone vaulted—and having a north and a south door, the latter opening into a porch. North-west of the nave is a bell tower, its ground floor having a vaulted roof, and connected with the north aisle by an open archway; there is also a small postern.

The choir was first built; a portion is of middle thirteenth-century date; the great east window and the eastmost one in the south wall would seem to be of this earliest period, but the walls in which they occur must be later. The reduced buttresses of the south-east angle are noticeable; 1318-37 is the date of this later portion of the choir, begun and completed in the episcopacy of Bishop Sinclair. What the cause of the reconstruction was is not known, and whether at the same time a nave was built, or the new choir was just attached to an earlier church, is also uncertain. In 1380 the English burnt the Cathedral; it seems probable that the part most affected was the nave, whatever its date may have been, so a rebuilding was necessary. This was the work of Bishop de Cairney, 1406-36, whose tomb stands in the south aisle, which vaulted aisle was, however, only completed by a successor, Bishop Raulston, in 1447. The south wall of the nave above the piers shows in the mouldings a marked difference from those of the north wall. Strangely enough, however, the three east clear-story windows are similar to those opposite; why and how they were retained while later work was being built under them, it is hard to say; the date of this rebuilding is most likely that of the south aisle. On the outside of the north aisle wall are marks of walling now disappeared. These, from the irregularity of their spacing, can hardly indicate buttresses; the aisle roof did not require them, so possibly they may have connexion with some former sacristy or cloister.

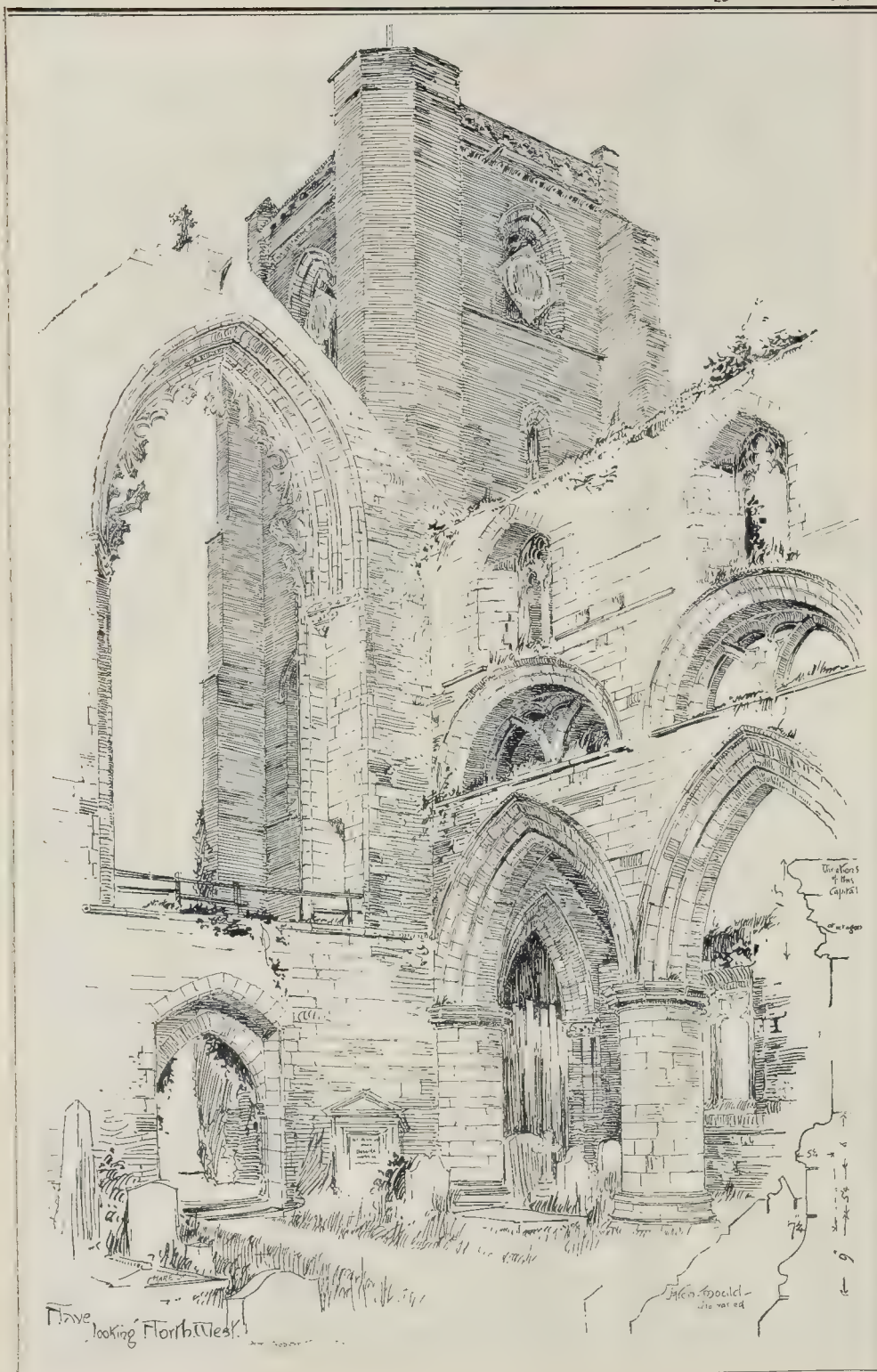
In 1457 the Chapter House was begun, and in twelve years finished. It originally had no exit-door, and the one connecting with the choir is, unfortunately, obscured with modern frames and lintel; quite possibly something better is concealed. At one time there must have been a large side window before the Chapter House was built against the choir; it, too, may only be concealed, the tracery will probably be gone, but the jambs may remain. Besides the Chapter House and

stalls erected in the choir, Bishop Lauder began the bell tower; that was not completed, however, till thirty years later, 1501. The tower is 96 ft. high, and is now covered with a flat roof, but that does not seem to have been the original intention; both Slezer's view (1692) and Pennant's (1769) show a saddle-back roof, and a conical termination of the turret stair; the other three pinnacles are not original.

In the tower west wall is a serious rent from top to bottom, in some places 3 in. wide; it does not, however, much affect the internal vaulting. The turret stair only descends to the level of the west window sill that affords a passage to the south stair. This window, in its defiance of all conventional rules of symmetry, is the peculiar feature of the whole Cathedral, and but little can be said in commendation of the freak: symmetrically placed between the two octagonal turrets, it is off the centre of both the door beneath and the gable above, where a circular window ineffectually tries to restore the balance; internally the effect is even more disturbing. On the north side of the choir is a wall arcade, interrupted opposite the Chapter House, where it is believed a wall tomb of Bishop Sinclair's was, and further east barbarously mutilated by a stone stair to the gallery, just where the arcade works into a sedilia. The presence of this wall arcade would seem to indicate that at the date of its building canopies to the stalls had not been anticipated. There is another sedilia in the later south wall, its centre compartment is blocked by the partition wall, but not apparently mutilated. The height of the side window sill is some 10 ft. from the floor, that of the great east window 15 ft., giving opportunity there for the decoration that is known to have existed of the miracles of St. Columba. Above the altar that stood against the east gable of south aisle are markings as if either a masonry or woodwork reredos had been affixed there. The sturdy piers of the nave, with their arches, form a fine arcade; the effect of the semi-circular triforium openings is not so happy on the north side where there is no vaulting, and so no passage-way, they are really meaningless. The lean-to wooden roofs of both aisles are alike. There is great variety in the design of the aisle windows, and some of the tracery is very interesting. The south porch is of slim construction, never vaulted, and so failing to carry out the original intention of the former builders, as is evidenced by a wall-

\* The series of illustrations of the "Ancient Cathedrals of Scotland," which was begun in our issue of July 1 last, will be continued in the first number of each month, until March, 1894. Particulars of this, and of the series of "Cathedrals of England and Wales," which ended in our issue last, will be found on page xxxiii; also of the short series of the "Ancient Cathedrals of Ireland" which will follow the Scottish series.









rib: the two low side doors to this porch, with square heads, are difficult to account for.

In the choir is a fine recumbent figure in armour; it is the effigy of a grandson of Robert Bruce, the Earl of Buchan and Badenoch—more commonly called the Wolf of Badenoch, the destroyer of Elgin Cathedral—and rests on a sarcophagus, on the sides and ends of which are compartments occupied by knights under delicately carved canopies not unlike those on Bishop de Cairney's tomb. The original position of this monument was in the middle of the choir, but it was shifted at the Reformation; beside it is the headless effigy of Bishop Sinclair, and also a fragment of what has been a large and very rich richly-carved Celtic Cross. In the Chapter House there is a seventeenth-century wall-tomb of no great merit, and a more recent Classic monument displaying the heraldic bearings of all the families connected with the House of Atholl; there is also a marble statue of the fourth Duke; underneath are burial vaults.

Among the notable ecclesiastics of Dunkeld was Bishop Scott, c. 1203, who, at a cost of half his revenue, dissociated Argyll from his diocese

because he did not understand the language of its inhabitants—Irish; Bishop Sinclair, known as the fighting or king's bishop, after his successfully rallying a sheriff's force of 500 horsemen, that was retreating before the English who visited the Forth in 1317. The turbulence of latter times is seen in the case of Bishop Lauder, violently interrupted at the Mass by a chief and his clan, and driven to take refuge in the choir roof. Another prelate, Gavin Douglas, author and translator, had his entering into possession disputed by a rival, who entrenched himself in the building, and placed artillery on the tower, and so held out for some time. The line of Romish bishops ended with Crichton, "a man well disposed, and a good housekeeper, but in matters of his calling not very skilled." "I thank God," he is reported to have said, "I never knew either the Old or the New Testament, and yet have prospered well enough. Dean Thomas, if you leave not these fantasies, you will repent when you cannot mend it"—this to one suspected of heresy, and afterwards burnt at Edinburgh. Such sentiments cannot have been confined to one when Canon Myles, 1515, could record approvingly of another, "this venerable prelate had such acquaintance with

divinity, that he himself preached the faith to his people."

In 1599 considerable damage was done; then perished the eleven altars, the rood-screen that stood under the chancel arch, the stalls, and many monuments. Thereafter, as the choir sufficed for the new form of worship, the nave was suffered to fall into disrepair, was soon unroofed, and so remains. Greater damage, structurally, was done to the choir in 1608, when the insurgent Highlanders, 4,000 strong, fresh from their success at Killiecrankie, attacked Dunkeld, then garrisoned by the regiment of Cameronians; the Cathedral became an improvised fort, and enabled the besieged to hold out successfully, but the edifice suffered severely from fire. The choir roof appears then to have been destroyed; if covered with lead that material would go first, for throughout the building wherever used for the fixing of bolts the lead has been roughly extracted for military use. The later roof erected for the Presbyterian congregation is of lower pitch than the original; within it is plaster vaulted. Besides the wall blocking the chancel arch, another is built to form a vestibule to the church at the east end of the choir. The



external appearance of the choir is much marred by the parapets and pinnacles built at the same time. In the church are two galleries; the pulpit is placed against the south wall, and opposite it is the ducal pew; this last is connected with the Chapter House, used exclusively as the private entrance thereto. The Cathedral stands in the private grounds of the Duke of Atholl, and that access is freely given to all, and interest taken in the building, money for its repairs not being spared, must be acknowledged; and yet criticism cannot be silent at the appropriation of parts of a historical and sacred building to private use. The ground-floor of the bell tower is degraded to the sordid purpose of a tool-house, and the archway to the aisle closely boarded up, thus shutting off what would prove a fine termination to the aisle vista. The north and south doors are of solid wood, freshly painted—surely superfluous in a roofless building! Passage-way might be barred by a railing, and yet permit of pleasant glimpses through. In some places quite distinctly the stone-work is being split by too-vigorous ivy; the beauty of the luxuriant vegetation would not at all suffer by pruning at these parts. The nave is really a cemetery with interments of almost monthly recurrence, but these are on the decrease, happily. The clock placed on the tower some thirty years ago is doubtless of public service, but it is unfortunate that the quite unnecessary solid dials (not shown in the view) should have their poles sunk into the stone joints; this, happily, is not an irremediable vandalism.

Information regarding this cathedral is not very copious; beyond the usual sources there is only Canon Myln's "Vite Episcoporum Dunkeldensis," written in 1515, and printed by the Bannatyne Club in 1823.

#### THE ANCIENT CHAPEL OF THE EPISCOPAL PALACE, CHESTER.

A small door in the baptistry of Chester Cathedral, opening upon a narrow turret stair, is now the only approach to this chapel, which was formerly within the Palace built by Bishop Keene, who was consecrated 1752, and resigned in 1771 on his appointment to the see of Ely. The chapel is of much earlier date, and was undoubtedly the Abbot's Chapel; the architecture is Late Norman, the groining of stone has moulded ribs, now covered with Jacobean plaster-work. At the east and west ends are corresponding elliptical arches, apparently the original windows; the west arch has been built up, and the east now forms the arch to a small chancel more lately built over the south cloister. This chancel has a rich and very beautiful Jacobean ceiling in plaster, and some fine oak panelling, with handsome folding doors. The oak altar rails remain complete. It is lighted by two mullioned windows on the north side, and the east window, seen in the drawing. In a kind of alcove on the south side is a stained glass window, looking into the north aisle of the Cathedral. The chancel is raised one step of 7 in. above the floor of the Norman chapel, and within the altar rails the floor is 3 in. above the chancel. At the east end of the Norman chapel are openings on each side of the chancel arch. At the north-east corner is a door leading on the lead roof of the Norman crypt, which runs the whole length of the west cloister, and over which stood the great hall and the green hall of the monastery, reaching to the north wall of the chapel. On the south wall, next the Cathedral, is a fine window, seen on the right of the drawing; this lights the baptistry. The part shown has been restored, but the other side has been left in its original state, and is in good condition. This window has evidently been a door communicating with the Abbot's lodgings, which extended from this point to the Abbey gateway, and now converted into the new King's School. On this site, and in close proximity to the door referred to, stood the gallery, the great dining room, the Darby Chamber, and the stone hall of the monastery. On the north wall of the chapel is a modern window, of large size, without mullions; this is merely indicated in the drawing by the light entering upon the left side; this window was necessary to light the baptistry in the Cathedral; but it has weakened the wall, and unfortunately the groining became insecure, and it is now supported on props. Immediately under the chapel is a Norman passage; leading from the west front of the Cathedral to the cloisters there are a few other vaulted chambers under the King's School worthy of notice.

The drawing gives a fair idea of the details of the Bishop's Chapel, and the effect on entering from the dark stair is striking and very beautiful.

The part of a door, now built up, seen on the south wall, near the window on the right side of



the drawing, opened upon an enclosed stair, for the private use of the Bishop, leading to the north aisle of the Cathedral.

When officiating, the Bishop was met at the bottom of this stair by the clergy and choir, and after service conducted back to the same place.

THOMAS P. IVISON.

#### THE WELLINGTON MONUMENT, ST. PAUL'S.

THE removal of the Wellington Monument from its old position in a chapel on the south side of the nave of St. Paul's, where it could be seen against the light, to its present position under an arch of the north aisle, where it is in a very good light, is an event worth commemorating by a fresh illustration of the monument. The title of the plate was intended to have been "The Wellington Monument: its new position," but as it was found necessary to obscure the aisle window behind in order to prevent the light interfering with the photograph, the latter cannot now be taken as representing the surroundings, but only the monument itself.

As every one knows, the design of Alfred Stevens, then an almost unknown man, was chosen on its merits in a competition, a choice which resulted in the production, after long delays, of a monument quite unequalled of its kind in this country, and worthy of the great period of Florentine art. But the illustration also serves to show how very incomplete the monument appears without the equestrian figure originally intended as the crowning feature. It is understood that Stevens's model for this figure exists, and that it will ultimately be completed and placed in position. It is to be hoped so, for, with so few fine monuments, we cannot afford to leave our finest unfinished.

#### SUGGESTION FOR THE REMODELLING OF THE NATIONAL GALLERY.

THIS must be regarded as what I have called it, a sketch of a suggestion—an "essay in the intervals of business"—and not as a fully-worked-out scheme.

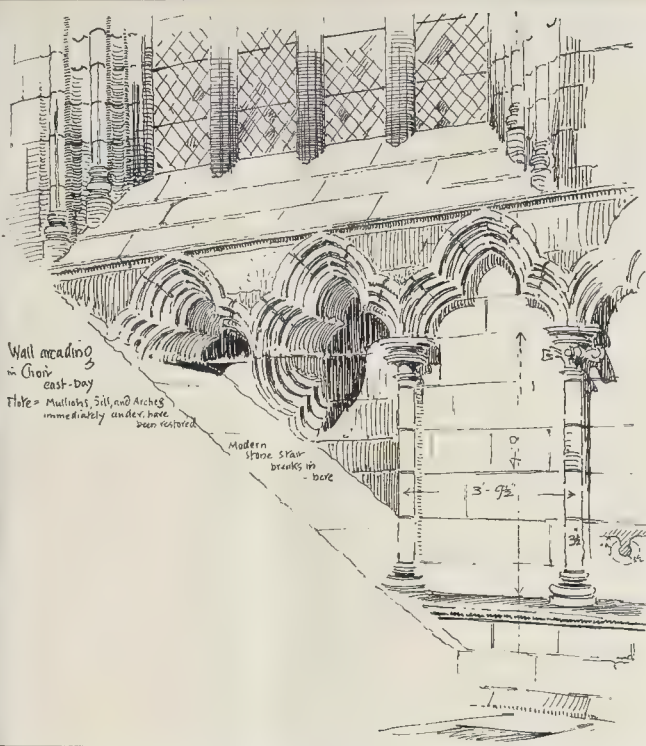
It seems probable that the National Gallery must be extended sooner or later, by the acquisition of the ground to the west of its present central block, and my object is to suggest what might be

done in that case to give greater architectural dignity and importance to the front, and to rearrange the interior of the front block so as to give it some degree of internal architectural effect and centralisation, without interfering much with the greater portion of the existing galleries.

It is to be hoped that no one could look at the existing plan of the front block, with its curious in-and-out irregularities of plan, and entire absence of any attempt at dignity of interior architectural effect or vista, and the middle which has been made of the two sets of entrance staircases, without feeling that, since all chance of a completely new National Gallery worthy of the nation seems to be at an end, there ought at least to be some effort made to improve this portion of the building. And without wishing to say anything disrespectful of Wilkins, it surely cannot be denied that the sight of his small and rather mean-looking dome, having no reference to anything on the plan, and with the low glass dome which is the roof of the new staircase immediately behind it, is from an architectural point of view almost ludicrous.

As far as the plan is concerned, it will be seen that the suggestion is to clear out the whole of the interior of the existing central block containing the present ill-assorted staircases, and to form a single staircase of monumental proportions, covered by a lofty dome, and decorated with a fountain in the centre of its middle platform. The gallery round three sides of the staircase hall forms a connexion on the same level with the three principal avenues of gallery, in place of the ingenious arrangement carried out by the Office of Works, whereby, in order to get from one portion of the galleries to another, you have to go down one set of steps and ascend another. The cross walls in the rear of Wilkins's tetrastyle porticoes are retained, but with wide central doors for a vista: and a double colonnade forms a wide central avenue, with a vista from end to end of the front block of the building, across the staircase and its fountain in the centre, and closed by a small domed sculpture hall at each end.

The treatment of these ends is the most troublesome part of the matter, as everything is out of centre in this portion of the existing building. The irregularly-placed walls of this portion are taken away and the lines of the main walls of the long gallery behind brought through to the front, and contrived with two domed recesses, each of



which is on the centre axis of the suite of galleries facing it. Unfortunately (as noted on the plan) the outer wall of the wing facing St. Martin's Church is now a fixed quantity, as it forms a symmetrical incident in connexion with the east flank of the new Portrait Gallery (not shown on plan), and therefore part of the space in the rear of this wall is turned into one of the domed niches aforesaid, and the rest I have shown utilised as a service stair; but it might be made a small cabinet gallery for gems or miniatures.

The new portion of the plan in the rear is shown as carried out symmetrically with the existing portion, with the addition of an apsidal recess for sculpture on the west side, corresponding with the position of the semi-circular portico or vestibule of the Portrait Gallery at the other end, which however is entirely disconnected from the National Gallery.

It will thus be seen that we have now a plan in which all the various portions are centralised, and which presents in its front range of galleries a decent opportunity for an interior architectural effect. It is suggested that these galleries with the colonnade should be reserved for decorative art—mosaics, bas-reliefs, &c., as a class of work having special affinity with architecture, and therefore suitably placed in the portion of the interior where architectural effect is most studied, and the paintings placed in the rear galleries, where (on the completed plan) there would be much more room for them than in the present gallery, even after deducting the front gallery for decorative work.

As to the treatment of the exterior, the suggestion is to preserve Wilkins's central portico and the two intermediate tetrastyle porticoes as they stand, and to retain the front wall between the centre and the end wings, only filling up the blank windows in the upper story and inserting into this portion of the wall a broad band of carved foliage to give a little richness to the front, with a portrait bust in a deeply-sunk medallion in the centre of each length of the carving. The actual windows below are left as they are, except for the insertion of a curved pediment head over each of them, to give a little more force and shadow to this portion of the front.

In the central portico it will be seen that a new column \* added internally on each side, making a double row of columns and pilasters at each end of the portico, corresponding with the interior piers of the dome, and giving greater

strength and richness of effect to the portico. The arrangement of the exterior stairs, so as to give access at the ends instead of at the front of the portico, as at present, is of course a very poor one architecturally, but the demands of the street line prevent any other arrangement; and I think it will be admitted that the widening of the steps, and the quarter-circle sweep given to them, is so far an improvement on the present steps. The suggestion for the central architectural feature may speak for itself; the idea was to raise a large and broad mass at the centre of the building, but to keep it in accordance with the grouping suggested by the plan, four angle towers and a central dome, architecturally connected with the towers as shown.

The treatment of the end wings was a puzzle; as though it was possible to secure a tolerably symmetrical arrangement internally, it was scarcely possible to do so in a satisfactory manner externally, in consequence of the exterior persistence of that eastern projection before alluded to. The only thing I could think of was to raise a perfectly plain blocking or surbase above the balustrade line, so as to disconnect the cupola from the lower details, which could not be altered and would not quite assimilate with its position. In regard to the south front of these wings, Professor Aitchison has already shown the probability that Wilkins never intended or wished to throw back the ends of his building in the weak and ineffective manner shown in the existing front, and he has suggested a columned portico projecting from the main line of building at each end.



The curved line of the roadway at the south-east angle suggested to me the idea of a semi-circular projection, harmonising with the curve of the roadway, and repeated, of course, on the west wing. The interior semi-circle gives a vista at the end of the east and west range of galleries. The section of the wall of this semi-circle would be somewhat as shown in the appended sketch section, the inward curve of the semi-dome affording space for an entire detachment of the columns in their upper portion, leaving a dark shadow between them, serving to throw out the capitals and the portrait busts placed between them.

The piers of the railings in front of the buildings are represented as being finished with heads or busts, after the same manner as the curious and picturesque railing-piers in front of the Sheldonian Theatre at Oxford.

Without perhaps seriously entertaining the idea that either this or any such scheme will be carried out, either by myself or any one else, I venture to protest against the view which some people would probably be ready to support, that it is any kind of architectural sacrilege to propose to cut up or remodel the building in any such manner. There has been a kind of attempt to whitewash the National Gallery of late; and my friend Professor Aitchison, in regard to the able restoration of Wilkins's possible intentions in the design as at first drawn out by him, which was published in the *Builder* of October 24, 1891, characterises the front as one of the best things of the kind we have. It would certainly have been far better if carried out in accordance with the restoration suggested by Professor Aitchison. But though the whole composition is well balanced, and Wilkins's colonnaded porticoes are carried out with the refinement of detail arising from a perfect knowledge of the style adopted, I cannot help thinking that the old opinion as to the National Gallery façade, that it is a tame and uninteresting affair, that the dome is mean and the turrets ridiculous, and the whole thing quite unworthy of the site, is not very far wrong; to which it may be added that the plan of the front range of galleries and the entrance is simply wretched, as a plan. I think no one will question that the plan of the interior, as proposed here, would be far superior to the plan as existing. As to the exterior treatment nothing further is claimed here except to show that something on a large scale might be done with the façade, without losing the best features of the existing one and without materially disturbing anything but the centre and the two ends of the front block of galleries. It might no doubt be done in a far superior way to this; and if so, so much the better.

H. H. STATHAM.

#### COMPETITIONS.

**BOARD SCHOOL, BURNLEY.**—Mr. Murgatroyd, architect, of Manchester, has just sent in his award respecting the competitive plans for a new board school to be built in Stoneyholme, Burnley, at an estimated cost of 10,000*l*. The first premium of 20*l*. is awarded to Mr. Quarmby, architect, Burnley, and the second (10*l*.) to Mr. Dunkerley, architect, also of Burnley. The competition was limited to local architects.

**PUMP-ROOM EXTENSION, BATH.**—At the meeting of the Bath Town Council on Tuesday, the discussion (adjourned on December 12 last) was resumed on the resolution of the Baths Committee:—"That provided the Council are satisfied that the omission of the name of the author of the design marked 'O' was accidental, this Committee is of opinion that such omission should not disqualify him, the same not having been detrimental to the other competitors." In accordance with notice given at the last meeting Alderman Jolly moved:—"That the resolution with respect to the plans marked 'O' passed at the meeting of the Council on December 5, 1893, be rescinded so far as it authorised that the work should be carried out." Colonel Davis seconded. In the course of a long discussion Alderman Chaffin said that if the resolution should be passed the premium should be taken from Major Davis should it transpire that he was the author of the design marked "O." They were inconsistent altogether. If they wanted to censure a man for being guilty of competing dishonestly then they should not condone that conduct by giving the premium. The amendment by Alderman Jolly was put to the vote, with the result that 26 voted for it and 19 against. It was then decided by a majority to adjourn for a week, although Alderman Jolly and others advocated resuming the debate, on the motion as to subsequent action, in an hour's time.

**PROPOSED NEW RAILWAY THROUGH HECKMOWKIRE.**—Mr. T. H. Tullock, A.M. Inst. C.E., Local Government Board Inspector, held an inquiry on the 21st inst. in the matter of the proposed displacement of a number of houses by the London and North-Western Railway Company in the track of their line from Heaton Lodge across the valley to Wortley, and the erection of others in lieu thereof. The company propose to pull down 126 houses, inhabited by 491 persons, belonging chiefly to the working classes, and to erect eighty six-roomed houses on the Cawley estate, in front of them.



## The Student's Column.

### THE STRUCTURE AND PHYSICAL PROPERTIES OF BUILDING STONES.—I.

#### INTRODUCTION.

**T**HE chief object of the present series of articles is to give a precise and accurate account of the structure and physical properties of building stones quarried or used in the United Kingdom. The observations are based upon our personal researches in almost every instance, and will, we think supply a want that has long been felt by architects. It may be said with perfect confidence that neither in our columns, nor elsewhere, has information of the kind about to be conveyed ever before appeared. Useful books on stone there are in plenty, to the student of languages, but none of them have approached the subject from the point of view here adopted.

In commencing, it will be well to give a brief outline of the literature relating to building stones, in order that the student may see in what manner this differs from previous productions. In the year 1839 a "Report on the Selection of Stone for Building the New Houses of Parliament," and in 1861 a "Report on the Decay of Stone" used in that edifice, made their appearance; and it may be said that these two official documents comprised practically all that was known up to their respective dates of publication concerning the building stones of this country as a whole. The Reports, however, were far from being complete, and from the hasty manner in which the bulk of the information was got together, especially for the more important document—that of 1839—they were not always accurate. The Commissioners were well aware of the shortcomings of the first Report; in order to cover the deficiency to some extent they excused themselves by saying that they were well aware that there were many other quarries in various parts of the country which they had not examined, where stone of different varieties, in some cases, perhaps not inferior "to those which have been brought under our immediate inspection," existed. Then the Commissioners tell us that "from many of such last-mentioned quarries we have received specimen blocks, and the requisite information concerning them since the completion of our tour." They did not consider it necessary to extend their inquiry to granites, porphyries, and stone of similar character. The reports, in spite of these drawbacks, however, afforded a veritable mine of information to those writers who shortly afterwards dealt with our building stones; and indeed nothing of any moment was added to them until the year 1886, when the subject was attempted to be brought up to date in these columns, and a large section dealing with granite and several other stones was introduced.

In the meantime other works had been published more or less bearing on the matter. Professor Hull had written a treatise, published in 1872, on the "Building and Ornamental Stones of Great Britain and Foreign Countries." This work is too small, and of too ambitious a character to have permitted the author to deal with any part of his subject in an adequate manner; so we find the granites of England dismissed in four pages, the oolites in twelve pages, and so on. Moreover, its tendency is too geological; the author does not seem to have recognised that geologists take but little or no interest in building stones as such, whilst if the work were intended for architects he should have known that much of the geology given could have no real significance for them, as not bearing on actual materials of construction.

In 1879 Part III of Rivington's "Notes on Building Construction" appeared. The section devoted to stone, so far as it goes, is most excellent; yet there is very little in it that is really original. The lists of stone quarries, even in the latest edition, are by no means complete, whilst some of the workings no longer exist (indeed they had ceased prior to the date of publication of the first edition); whilst some others never had any existence at all, the errors having apparently arisen from the stone exhibits of the 1851 Exhibition, or to specimens which to this day are on view in the Jermyn-street Museum, that were polished more out of curiosity than anything else. Neither are the materials described at any length in Rivington's "Notes." It does not, however, profess to be a text-book on building stones; and bearing in mind the limited space at the author's disposal we have nothing but unqualified praise to offer in regard to the

work as a whole; it is a clever, useful compilation, a model of precision and correct expression so far as the literature of the time allowed.

In addition to the above, there are various works treating partially of the subject, such as Ansted's "Applications of Geology to the Arts and Manufactures," 1865; Barlow's "Treatise on the Strength of Materials," 1867; Davies' "Slate and Slate Quarrying," 1878; Anderson's "Strength of Materials and Structures," 1880; Unwin's "Testing of Materials of Construction," 1888; and Lee's "Marble and Marble Workers," 1888. The "Proceedings" and "Transactions" of several societies contain isolated papers relating more especially to local materials; these will be referred to in the following articles as occasion may require.

We shall make no pretence of giving a bibliography relating to building stone, but it may be useful to mention a few Continental and American publications from which we have at one time or another derived information. For the most part they do not refer to British materials, though questions as to quality, &c., which apply to all stones alike are frequently discussed. Amongst German works we might mention Böhme's "Die Festigkeit der Baumaterialien," 1876; Gerstenberg's "Katechismus der Baumaterialkunde," 1868; Gottgetreu's "Physische und Chemische Beschaffenheit der Baumaterialien," 1880-81; and Schmidt's "Die Baumaterialien," 1881. In France there are Chateaux's celebrated "Technologie du Bâtimement," (2 ed., 1880); the "Rapport sur l'Exposition de 1889," Mermin's "Resistance des Matériaux," 1889, whilst in Belgium we have Malcoet's "Matériaux de Construction employés en Belgique," 1866. In Sweden Hjalmar Lundbohm has published much on the subject—"Några Upplysningar om Sveriges Steinindustri," Copenhagen, 1888, and Gottenburg, 1891; and we might make special mention of the same author's following works, which, as will be seen, refer more particularly to England—"Engelska Byggnadsmaterial och Byggnadssätt samt de senares tillämpning i Sverige," 1889; "Om Bearbetning af Sandsten, Kalksten och Takskiffer i Storbritannien," 1889; and "Om Granitens dustrien i Upland och Sidskild Storbritannien," 1889.

The last three works form quite a monograph for Swedish readers, on the stone industry of this country, and being official publications of the Swedish Geological Survey, and based mainly on personal investigation, have a special value.

The United States have contributed a great deal towards the literature of building stones. There are Hall's "Report on Building Stones"; Newberry's "Report of Judges on Building and Ornamental Stones" at the International Exhibition of 1876, Washington, 1880; Smock's "Building Stones in the State of New York," 1883; "Tenth Census Report," 1884; Thurston's "Materials of Construction," 1885; Gillmore's "Notes on the Compressive Resistance of Free-stones, &c.," 1888; and Merrill's "Stones for Building and Decoration," 1891. The last mentioned work is decidedly the best text-book extant on the building stones of the United States; whilst it deals in some measure also with the materials of other countries.

Now, if we had to criticise the English works above mentioned, we should say that they are chiefly based on the experience of or reliance on others than the authors themselves. In regard to those referring to experiments we have no doubt that these latter were carried out under the immediate supervision of the authors; the stones experimented upon, however—and this is the crucial point—were not collected by the authors, but were, in nine cases out of ten, sent to them, by divers persons, mostly interested peculiarly in the results obtained. That the senders carefully selected the materials before despatching them, goes without saying; we hope the transmitters always gave each stone its correct designation, though we are in many cases extremely doubtful on that head—a scepticism born of experience. This observation applies quite as much to the Commissioners' "Report" referred to, as to any other publication.

Further, the information given respecting the stones is in all cases so meagre as to have but little value in the eyes of the architect. Except in very rare instances the beds in a quarry are not mentioned specifically, and when they are, it is mostly to emphasise some geological point of no use whatever to the practical man. Still rarer are references made to the prevalence, or otherwise, of vertical joints and sizes of blocks; we have looked in vain for particulars concerning

the comparative hardness or facility of tooling. But we cannot occupy our limited space with lamentations over the shortcomings of other writers' works. Enough has been said, we think, to show the student that the bulk of experiments carried out on British building stones are so unreliable in regard to the materials operated upon, that in the present state of the subject it is preferable to discard them and begin afresh, except where our personal knowledge enables us to utilise the results. Apart from foregoing considerations, it may be pointed out that the majority of experiments, although quoted extensively at the present day, are very old, and require confirmation.

Our programme is briefly this. We shall not describe the quarries themselves, as that phase of the subject has already been treated of in these columns; but we shall give sufficient information to enable the student to know the precise "source of origin" of each stone alluded to. We have personally visited nearly all the principal quarries in the country, and a great many smaller workings, to the number of about 400. We have taken note of the disposition and thicknesses of all the building stone beds in each quarry, the distance apart of joints, &c. We have also selected a fair sample of at least one specimen of stone from each quarry, and, where circumstances seemed to demand it, we collected a sample from each bed in the quarry. These samples were marked on the spot with a distinguishing number referring to a corresponding one in our note-book. We hope to visit the few remaining principal quarries during the next three months, and deal with them in a like manner before the conclusion of this series. From this, the reader will perceive that the chances of mistake in regard to "source of origin" are remote in the extreme; for not only do we know the quarry from whence each stone comes, but the actual bed in that quarry. Moreover, the experiments to which the samples have been subjected were carried out by ourselves, in order that the risk of confusing the stones might be reduced to a minimum.

That some such careful method of selecting and identifying the material was highly desirable from the architect's point of view became evident immediately we commenced investigations. A few illustrations by way of exemplification may be adduced.

In more than one case we discovered that certain firms possessing one or two quarries were in the habit of sending one kind of stone to market under various names, the names in each case referring to the materials of some rival in trade. It is right, however to mention that the spurious names adopted referred, in a few instances, to stone inferior in quality to that of the stone thus wrongly named. It was not that the owners (in these few instances) were not aware of this fact, but that the inferior stone had caught the attention of the market, whilst their own was less known. This practice is commonly resorted to where a new quarry is opened up.

Knowing that some architects largely rely on the quarry mark of a stone, believing that all stone bearing that mark comes from a certain quarry, instinct led us to make careful investigation as to the relation existing between the marks and the quarries. In some cases we saw that stone so marked, faithfully represented the facts as the architect believed them, but our inquiries in other instances led to an entirely opposite conclusion, especially when we found that the marks referred not so much to the quarry as to the gang of men working therein; where the men, from any reason whatever, removed to another quarry their marks followed them, and the stone raised in the new locality received the same mark as that from the quarry they had abandoned. We might continue quoting experience of a similar nature, but it would serve no useful purpose other than that already demonstrated.

The specimens of stone collected have been subjected in the first place to microscopic examination in a manner to be described in a future article. We have frequently advocated this method in our columns, though with few exceptions we have not put it into practical application. Small briquettes of each have been cut and experimented upon with a view to ascertain their relative powers of absorption of water, specific gravity, &c. The stones have each undergone a careful examination, both at home and in the field.

We hope to show that the stone from each quarry, and in most cases from each bed, has distinct microscopic structure, which anyone with but a moderate care can recognise, without any special scientific training. To show the extent of this observation, and to give some idea of the



detailed manner in which we shall proceed, we may remark that in the Bath area alone we visited forty-two quarries and collected seventy-three samples of Bath stone. Each bed, so far as we have been able to examine it, has a definite micro-structure, and where the latter is not as distinctive as might be desired, the physical properties mentioned—specific gravity and absorption of water—assist in the determination. And we shall give concise particulars regarding nearly all these stones; so that if the architect pays sufficient attention he will be able to ascertain for himself whether, a certain stone having been specified, that stone or some other is sent on to the work.

The general trend of the present series, then, is a distinctly scientific one, and is primarily intended to enable students to identify building stones by learning something of their disposition, structure, and physical properties. Incidentally, the influence these latter may have in determining the durability of the several stones described, will be touched upon.

#### GENERAL BUILDING NEWS.

**ENLARGEMENT OF HORFIELD CHURCH, GLOUCESTERSHIRE.**—The additions recently completed at Horfield Church, which consist of chancel, chapel, organ-chamber, and a portion of the north and south transepts, with lantern tower over the crossing, form the principal portion of the scheme of enlargement, which has yet to be completed by the building of the remaining portions of the transepts. The lantern tower assists in lighting the centre of the building. The work has been carried out by Messrs. W. Cowlin & Son from the designs of Messrs. Henry Crisp & Oatley. The carving has been done by Messrs. Davey & Bushell, the glazing by Messrs. Joseph Bell, Sons, and the heating—which is by means of hot water—by Messrs. Crisp & Sons.

**RESTORATION OF ROTHERFIELD PARISH CHURCH, SUSSEX.**—The Church of St. Deny's, at Rotherfield, has just been reopened after restoration. The work, done in portions, has occupied altogether four years, but it is only during the last three months or so that divine services in the building have had to be suspended. The repair of the church has been very general, as when it was commenced the building was rapidly approaching a ruined condition. The walls and buttresses had to be underpinned, the stone tracery on the windows restored, and lead and glass put in. The stone tracery in the tower had to be renewed from top to bottom, and the roofs of the lady chapel and chancel repaired, with other work on the exterior. This formed the first portion of the restoration at a cost of 1,142l. 6s. 2d. The architects were Messrs. Medland & Powell, of London. Before commencing the second portion of the work the committee secured the services of Mr. Ewan Christian as architect, who expressed approval of what had been done. The second portion of the work was both exterior and interior. Among other things the nave roof has been uncovered; the roof of the chancel has been similarly treated, so as to show the waggon-headed timbers; and the whitewash and plaster have been removed from the old stone walls. While this was being done, some remains of Early English painting came to light. These have been carefully preserved. Messrs. Medland & Powell also rendered assistance in this part of the restoration.

**RESTORATION OF ST. STEPHENS-IN-BRANELL CHURCH, CORNWALL.**—St. Stephen's Church, Grampond Road, Cornwall, was re-opened by the Bishop of Truro, after a thorough restoration, on the 28th ult. The church, which is of considerable architectural interest, was badly renovated some forty years ago, and much of the present work has been necessitated by the poor quality of the work of that date. The cost of the restoration has been between 1,200l. and 1,300l. and has been carried out from the designs of Mr. George H. Fellowes Prynne, F.R.I.B.A., by Mr. James Julian, builder, of Truro; Mr. C. E. Perkins acting as clerk of works. The heating apparatus was supplied and fixed by Mr. De Ridder, of Liverpool.

**ST. JOHN'S CHURCH, BOSCOMBE, BOURNEMOUTH.**—On the 27th ult. the foundation stone was laid of St. John's Church, Boscombe, Bournemouth. The building will have a nave 107 ft. by 26 ft. 6 in.; two aisles (north and south) 107 ft. by 13 ft. 6 in. each; chancel 37 ft. by 26 ft.; chancel aisle 18 ft. 6 in. by 12 ft.; outer aisle 38 ft. by 14 ft. 8 in.; organ chamber, vestry and clergy vestry. Externally it will be of flint with Castle Cary bands and Bathstone dressings in the fourteenth-century style, with tracery windows, of which the west will be six-light and mullioned, and the east five-light. The roof will be of open pitch-pine, covered with pitch-pine boarding; the chancel flooring of encaustic tiles, and the remaining flooring of wood plank set in concrete. The heating is to be by hot water. A flèche will surmount the nave roof, in which will be a ventilating shaft. The whole of the interior walling is to be of Bath stone, and the arches and arcades of alternate Corsham

and Winsley stone. The seating accommodation, estimated for 1,021, will be of pitch pine. Lighting provision will be both by electricity and gas. The architects of the church are Messrs. J. O. Scott, F.S.A., London, and C. T. Miles, Bournemouth, and the builders are Messrs. Perkins & Sons, of Bournemouth.

**THE BUILDING TRADE IN GLASGOW.**—According to the Glasgow papers the building trade during the past year has been, and now is, of the very brisk description. No trade, in fact, in Glasgow or the West of Scotland has been so busy, the departments falling under stone and brick builders having been particularly well occupied. Operatives in all branches of the trade have been found scarce, and at any time a much larger number of men could have readily secured employment. This gratifying state of affairs has to some extent been due to the Underground Railway operations, in connexion with which a considerable number of workmen are regularly employed; but besides this, new jobs have been numerous and large. In the city alone a number of structures under erection have given steady employment to a considerable body of men—the Conservative Club and another building in Bothwell-street, the insurance offices in Renfield-street, warehouse in Sauchiehall-street, and the Temperance League offices in Hope-street, and large tenements of shops and houses in Argyle-street, Great Western-road, St. Rollox, and other parts of the city. It is estimated that nearly 5,000 men—including about 1,000 masons' labourers—have been employed during the year, and there is every indication that this state of affairs will continue. A number of large buildings are only half-way towards completion, and the erection of many others is just beginning or is in contemplation. Among the former class may be rated Hawkhead, Woodlee, and Gartosh Asylums, the Deaf and Dumb Institute, West Campbell-street, a block of nineteen tenements on the South Side, and various other similar erections; and, on the other hand, it is expected that the Art Galleries in Kelvingrove Park will be actively commenced immediately after the New Year, when a number of tenements and smaller buildings are also to be proceeded with. Wages have been, and are, at the standard of 83d. per hour.

**RESTORATION OF CHILBOLTON CHURCH, HAMPSHIRE.**—On the 16th ult. the parish church of Chilbolton was reopened after restoration. The present chancel of St. Mary, Chilbolton is of the middle and the nave of the latter part of the thirteenth century, while a perpendicular window of the fifteenth century occupies the west wall. The nave has two side aisles separated from it by arcades. A tower occupies the south-west end of the south aisle. The work recently undertaken has provided for the stability of the fabric, and has also revealed such points of interest as the restorers of the early part of this century had hidden away. When the plaster ceiling was removed the old nave roof was found to be a trussed rafter roof of the same date as the fabric. It was, however, in a very decayed state. The works now completed comprise a new oak roof to the nave—in which it was possible to incorporate two old beams and one or two timbers only from the old roof—new oak roofs to aisles in place of former deal ones, new vestry and organ chamber, heating apparatus, new east window, and sundry repairs to the nave and chancel, comprising the re-building of the gable walls at either end and the strengthening of the walls throughout. The following works have still to be undertaken:—Repair and completion of the tower, chancel roof, and roof of nave, new stalls, new organ, and alterations to the south porch. A Norman clerestory window, as well as some fragments of Norman stonework, were discovered during the restoration. On stripping the modern plaster off the east gable of the nave the old plaster was found intact, with the remnants of a fresco, now visible. Two angels holding a crown over a head and some parts of a vesica are still faintly visible. In re-plastering the interior walls, which are roughly built of flints, the old manner of plastering with a thin coat, which shows the texture, has been followed. The putlog holes by which the original scaffolding was erected in the thirteenth century were found to be so carefully formed in stone that they have been left visible. Portions of thirteenth, fifteenth, and seventeenth century windows were found built into the walls. The last was of wood only; but the remains of the two former have, with other objects of interest, been collected and built into a receptacle formed for the purpose in the new vestry. The oak triptych reredos was designed by the architect, and executed by Messrs. Luscombe & Sons, of Exeter. The central portion represents the Crucifixion with the Virgin and St. John. The east window is the work of Messrs. Powell & Sons, of Whitefriars, London. The contractors for the general work were Messrs. Cornish & Gaymer, of North Walsham. The architect was Mr. W. D. Caroe, M.A., of London.

**THEATRE, ROTHERHAM.**—On the 1st inst. a new theatre was opened at Rotherham. The building is of pressed brick, with Horton stone dressings, pediments, &c., the style adopted being the Renaissance. The windows are of the French casement pattern with tinted glass. The principal entrances are from Nottingham-street, with two

emergency exits to that street and three to Howard-street, and three others on the other side of the structure. The staircases are of solid Green Moor stone, those to balconies and dress circles terminating on a landing with crush passages to each department. The circle front is of fibrous plaster. The proscenium opening (29 ft. wide and 24 ft. high) is formed of pilasters with pannelled and moulded bases, dados, and caps, relieved with plaster enrichments which return on the top with pannelled soffits; and surmounting this is a plastic design representing music and art. The ceiling is dome shaped in panels with ornamental centres. A fireproof curtain and iron doors shut off the stage from the auditorium. The architect has been Mr. Joseph Platts, Rawmarsh and Rotherham; contractors, Messrs. Thornton & Son, Rotherham; gas chandeliers, Messrs. Guest & Chrimes, Rotherham; ventilation, Mr. T. W. Ward, Sheffield; decorators of circle fronts, Plastic Decoration Company, London; painter, Mr. J. Woolen, Rotherham; joiner, Mr. W. Brookes, Rotherham.

**TOWN HALL, CLONTARF, DUBLIN.**—On the 21st ult. the foundation stone of the new Town Hall, Clontarf, was laid. The new hall comprises a public room 65 ft. by 35 ft. At the rear there is provision for a boardroom, commissioners' office, lavatories, &c., the upper portion being devoted to rooms for the caretaker, &c. The architect is Mr. W. G. Perrott.

#### SANITARY AND ENGINEERING NEWS.

**UTTOXETER WATERWORKS.** An act of Parliament was obtained to enable the Uttoxeter Rural Sanitary Authority to construct waterworks at Uttoxeter to be supplied with water first from Bramshall spring, with a proviso that if such spring was certified as insufficient by the Local Government Board, certain springs at Somershall might be taken compulsorily. The Local Government Board Inspector, Colonel Ducat, R.E., held an inquiry on the 12th inst., as to the sufficiency of the Bramshall spring. The clerk, Mr. Hawthorn attended. Mr. W. H. Radford, C.E., of Nottingham, the engineer of the works, gave evidence that the waterworks had been carried out at a cost of 4,800l. for works only. There had been 838 houses connected to the mains, producing an income of about 450l. a year, which was increasing daily, making the works a financial success. He always advised that the Bramshall spring would be insufficient for a population of 5,000, requiring 75,000 gals. a day, and they found they had only 37,800 gals. available from there in dry weather. There was not sufficient to give a constant supply or to fill the service reservoir, which holds 150,000 gals. The Somershall springs were three and a-half miles away, and they would give a sufficiency of water except in very extraordinary dry weather. The water would be delivered by gravitation, like the Bramshall water. The Authority had sufficient funds in hand for the extension, and wanted to carry it out at first, but, in consequence of opposition from landowners, they were unable to do so. There was no opposition.

**LONDON WATER.**—Professors W. Crookes and W. Odling, in a report on the results of their analyses of the 152 samples of water collected by them during November from the mains of the seven London water companies taking their supply from the Thames and Lea, say:—"Comparing the average composition of the five Thames-supplied waters during the month of November with that of the corresponding month last year, we see considerable differences. In November, 1893, the common salt, nitric acid, and hardness are practically the same as they were last year, but in the other constituents, those which may be termed the contaminating factors—the month just ended shows a diminution of more than 50 per cent., whilst the brown colour, a good rough criterion of the organic matter present, has sunk from 24.5 to 15.5. As compared with the composition of the October waters, that of November shows scarcely an appreciable difference, and for all practical purposes they may be looked upon as of the same excellent quality that has characterised the waters for several months past. Again we have to record a deficient rainfall. Whilst the mean rainfall for twenty-five years at Oxford has been 2.31 in. for the month of November, there has actually fallen 1.68 in. during the month, giving a deficiency of 0.63 in."

#### FOREIGN AND COLONIAL.

**FRANCE.**—MM. Garnier, Coquart, Pascal, Daumet Ginain, Raulin, Laloux, Normand, Loviot, and Redon, have been elected members of the committee of the Société des Artistes Français. The Chamber of Deputies has before it, officially, a project for consideration for a ship-canal between the west coast of France and the Mediterranean. At Villiers-sur-Marne a new consumptive hospital for children has been built from the plans of M. Isabey. The Conseil-General of the Seine, which has suppressed as unnecessary the post of Architect-in-Chief of the Department, held by M. Trélat, has created three architectural sections, one for the arrondissement of St. Denis, another for that of Sceaux, and a third specially entrusted with the construction of the gendarmerie barracks in the Department. The competition between architects' pupils



### CONTRACTS—Continued.

*Those marked with an Asterisk (\*) are advertised in this number. Competitions, p. iv. Contracts, pp. iv., vi., viii., ix., x., xii. and xiii.*

**CHRIST CHURCH CATHEDRAL, DUBLIN.**—On the 26th ult., Mr. Thomas Drew, R.H.A., architect to Christ Church Cathedral, Dublin, delivered a popular lecture on Christ Church and its history to a large number of visitors. He said the cathedral differed from other churches in not having a record of discord or religious dissensions. It was plundered by Henry VIII., and no religious community was ever expelled from its walls. It was in no sense a "cathedral of the people," and it was not the occupation of Dublin by the Danes 440 years ago. After the battle at Clontarf, Eirik Sigurdson, a Danish king, became a Christian, and in 1038 A.D. built a church, the foundations of which constitute the crypt which exists under the present cathedral. On the site of that Danish church the first Anglo-Norman one was founded in 1170 A.









# The Builder.

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## ILLUSTRATIONS.

Monument to Raffet, the Military Painter, recently erected at Paris.—M. Frémiet, Sculptor .....	Double-Page Ink-Photo.
St. John's College Chapel, Hurstpierpoint (the Tower and Ante-Chapel).—Messrs. Carpenter & Ingelow, Architects .....	Double-Page Ink-Photo.
Sketch Design for a small Market Hall.—By Mr. H. Seton Morris .....	Single-Page Ink-Photo.
"Hill Side," Sussex.—Mr. Reginald Blomfield, M.A., Architect .....	Single-Page Ink-Photo.
Pulpit in Rotherham Parish Church.—Measured and Drawn by Mr. H. L. Paterson .....	Double-Page Photo-Litho.

## Blocks in Text.

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### Dr. Furtwängler's Investigations on the Parthenon and Erechtheion.\*



N the domain of Greek Archæology the event of the year just completed is unquestionably the publication of Dr. Furtwängler's book on the "master works" of Greek sculpture. The starting-point of the book is the Lemnian Athene of Pheidias, and down to the Apollo Belvidere we have a succession of brilliant suggestions, sometimes amounting to demonstration. Everywhere the protest is raised against the traditional method of repeating the generalisations of Brunn with a few stock illustrations, a method that was almost a fixed tradition in handbooks. Dr. Furtwängler widens the field, includes monuments hitherto unknown or barely noted, and everywhere pursues an inductive method straight from the actual sculptures, observed in the closest detail.

This—the main drift of the book—we must, however, leave unconsidered, and confine ourselves to what is in fact an episode, but for English archæologists one of surpassing interest, *i.e.*, Dr. Furtwängler's discussion of the ancient temples of the Acropolis in direct relation to the interpretation of the Parthenon marbles. In order to get a clear conception of the art of Pheidias we must understand the Parthenon marbles, and these, Dr. Furtwängler asserts, can never be rightly interpreted till the full functions of the Parthenon itself are understood, and the temple is set in its right relation to the other sanctuaries that preceded and followed it.

To do full justice to Dr. Furtwängler's argument we ought perhaps to take it step by step in the historical sequence he follows. We prefer, however, to state at the outset two startling discoveries he claims to have made—discoveries closely interdependent.

First and foremost—and here the discovery amounts to what sounds like a paradox—the

Parthenon is not the temple of Athene Parthenos.

Second—the *opisthodomos* of the Parthenon is not a treasure house of Athene at all, but a separate shrine dedicated to other divinities.

It has long been known that according to early usage (*i.e.*, in inscriptions dealing with treasury accounts, which begin in 434 B.C.), the name "Parthenon" is applied, not to the whole temple as now, but merely to the back western chamber; the cella which held the actual image of the goddess was known as *ὁ ναὸς ὁ ἑκατόμπεδος*. Since this point was made clear the question has been often raised, why should this western chamber, which does not communicate in any way with the actual main cella, give its name "Parthenon" to the whole building? Dr. Dörpfeld rightly observed that the name Parthenon did not, and could not, come from the Chryselephantine statue, as this was never officially known as the "Parthenos." The mystery remained, why should this back chamber, always supposed to be a treasury, take its name from a mere popular title of the goddess who dwelt in the perfectly distinct Hecatompedos?

The solution Dr. Furtwängler proposes is that the word "Parthenon" is not taken from the Chryselephantine statue, nor yet from any epithet applied to the goddess. According to the analogy of other similar words—*e.g.*, *ὁ προβατών*, the sheepfold *ὁ γυναικῶν*, the women's part of the house—*ὁ Παρθενῶν* means, not the chamber of the maiden, but of the maidens. As in the ordinary house one portion is set apart, specially secluded, for the women, so in the house of the gods, in the temple of Athene called the Hecatompedos, the western chamber is the cultus cella of the Parthenoi.

Parthenoi—maiden goddesses—are not far to seek in the Acropolis,

Where below Pallas temple-bound  
Agraules daughters three go round;  
Where thou, O Pan, art piping found,  
Within thy shepherd cave.

Eur., Ion. 492.

Three daughters of Agraules, or Cecrops, three daughters of Erechtheus, Charites, nymphs, their regular cultus name was simply "Parthenoi." To them was brought the ancient wineless offering, the *νηφάλια*. Two of them we know to have had separate sanctuaries, Agraules and Pandrosos; but when Perikles built his new temple he

gathered their scattered worshippers into one maiden chamber, the *opisthodomos* of the temple we call the Parthenon—no mere treasury-chamber, but in itself an actual naos or shrine. How easily the name, from denoting the smaller half, should spread to the whole, is obvious enough when we consider that Athene herself, in her later aspect, was the typical maiden.

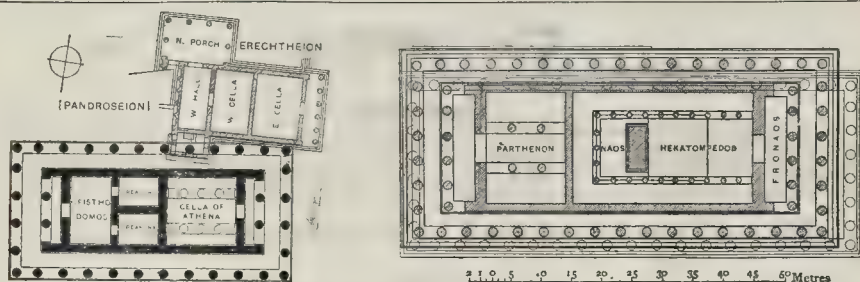
This interpretation of the *opisthodomos* of the Parthenon as a separate cultus cella is but a single instance of Dr. Furtwängler's general contention that in the temples of the Acropolis *no separate treasury-chambers exist*; each temple was a treasure-house of all objects of value appertaining to the god and goddess—votive offerings, ritual apparatus and the like. The moneys of the state might be lodged under the guardianship of a deity, but there was no separate chamber set apart as the treasure-house. About temples in the other parts of Greece this question has never been raised. The temple of Apollo at Delos should surely, if any, contain a treasury-chamber; the extant ground-plan shows clearly that none such existed. The temples of Hera and of Zeus at Olympia had no treasure-room; little separate treasuries, of which the ground-plan is still extant, were built to the several states. The idea of these treasure-chambers arose in relation to the Acropolis temples, the Parthenon first and foremost, and later, on its discovery, the same idea was applied to the temple long known as the "old Athene temple." In both these cases the ground-plan is substantially the same—*i.e.*, we have not only a cella with pronaos, but a second cella facing west, back-to-back with the first. It was long thought that in the case of the Parthenon two doors led from the east to the west cella. Dr. Dörpfeld has conclusively proved that these doors are of Byzantine date, and that in classical days no intercommunication existed. What, then, was the object of the western cella? If a treasure-house, why was it thus cut off?

Dr. Furtwängler's answer is that temples with this ground-plan with the western cella as well as the eastern have invariably a double dedication, the cella to the east built for the god and goddess, that to the west for a hero or some subordinate divinity.

This brings us to the question of the "old Athene temple"—a misnomer, as will be seen—and its relation to the Erechtheion

\* Meisterwerke der Griechischen Plastik, Kunstgeschichtliche Untersuchungen von Adolf Furtwängler, mit 140 Textbildern und 32 Lichtdruck-tafeln in Mappe. (Leipzig, Berlin, 1893; Giesecke & Devrient.)





Plans of the Old Temple of Athens, the Erechtheion, and the Parthenon.\*

in fact, to the whole sequence of cults and sanctuaries on the Acropolis.

Even after the discovery of the "old Athens temple," and perhaps owing to the name thus hypothetically attached, it has all along been assumed that close at hand, somewhere beneath the present Erechtheion, there existed an earlier Erechtheion. No traces of any such building have been discovered, still they may have disappeared. The current view is that the "old Athens Temple" preceded and was superseded by the Parthenon, and that an old Erechtheion preceded, and in like manner was superseded by, the present building. Dr. Furtwängler revolutionises the whole situation. The "old Athens temple," with its two cellas back-to-back, belonged not to Athens alone, but, as his general view requires, to two divinities, Athena and Erechtheus. Moreover, it was primarily the house of Erechtheus into which Athena entered, and in Homer's day (or rather in the time when the interpolations in question were made, Iliad II. 546, and Od. vi. 80, 781) it bore the name of Erechtheus. It was, in fact, the old Erechtheion in which, as in the new building, Athena occupied the eastern cella. Herodotus fits in equally well; his temple of Erechtheus (viii. 55) is but a special name for the sanctuary, which he elsewhere calls *τὸ μέγαρον* and *τὸ ἱερόν*. He knows but of one great cult place; a portion of this (*i.e.*, the eastern cella) he specialises as *ἀδύτων ἢς θεῶν* (v. 72). In the sixth century, be it in the Homer interpolations or in Herodotus, we have the picture of a joint worship, a conjoint sanctuary. The masonry left in the extant ground-plan agrees well with this view; the substructure of the colonnade, acknowledged to be substantially later than the naos itself, dates back to Peisistratos, or possibly Hippias. The naos must recede considerably. Below this naos are remains of a still earlier structure. This must date back into the dark interval between the Mycenaean period and the beginning of actual history.

Yet another point. Given that the "Old Athens Temple" was in effect an old Erechtheion, then we may compare it with the new Erechtheion and see what light is thrown thereby, both on the structure and meaning of both.

Few things have remained more puzzling and unsatisfactory than the ground-plan of the Erechtheion, especially when taken in connexion with the account by Pausanias, some important points become at once clear. The Erechtheion is divided into three chambers—the cella, presumably of Athena, to the east—and a larger cella to the west, itself divided into two chambers. Exactly this same peculiarity marks the old temple—a small cella to the east—for Athena, a larger cella, westward, itself divided into two chambers communicating with each other. One of these chambers is again subdivided, and here the narrative of Pausanias comes in to help.

Just as he is about to note the well of sea

water, Pausanias make the remark that the building is divided into two compartments (*διπλοὺν γὰρ ἵστί τὸ οἶκον* (I. 26, 5). This doubleness of the building has always been a crux; two stories have been suggested, but for this there is no architectural evidence; the difficulty finds an easy solution if the new Erechtheion is based on the plan of the old temple, with its exceptional double division of the innermost western chamber.

The further question arises, what was the object in both temples of this division. Dr. Dörpfeld thinks that the two small chambers of the old temple are treasures—the *οικίσματα* of the famous Hecatompedon inscription (*Δελφικόν*, 1890-92).\* Dr. Furtwängler, relying on his general proposition that no special treasure-chambers existed, and, further on his theory that the Erechtheion is, in plan, a restoration of the old temple, sees, in the small chambers, separate cultus-cells, divided because belonging to different divinities. In a word, both Erechtheion and old temple give their smaller eastern cellas to Athena, and their larger and completely divided western cellas to Poseidon, Erechtheus, and cognate divinities, the northern small chamber to Poseidon Erechtheus himself, the southern one to Hephaestus and Butes, the westernmost undivided chamber to Cecrops. The full force of this argument can only be appreciated by examining with Dr. Furtwängler the Erechtheion inscriptions, which space does not allow us to do here.

We are now in a position to take up the sequence of cults and the temple arrangements depending on them in accordance with Dr. Furtwängler's view. Up to 480 B.C.—*i.e.*, when the Acropolis was sacked by the Persians—there was one, and one temple only, *i.e.*, the old temple sacred in the main to Erechtheus and Athena, called sometime *τὸ οἶκον*, some the *Ερεχθεῖον ἱερόν*, sometimes *τὸ μέγαρον*, according as the whole or part is mentioned. In and about the Erechtheus portion, that is, within the sacred precinct, were worshipped Cecrops and his daughters, Butes, and possibly Hephaestus; also within the precinct, though not within the temple, were the sacred tokens, the spring, the trident-mark, the olive-tree.

After the Persian invasion the sanctuary had to be rebuilt. What was done by way of restoration of the old temple for immediate need cannot be known, but Dr. Dörpfeld and Dr. Furtwängler agree that the colonnade was never restored, and this for an obvious reason: some bold revolutionary spirit proposed to move the centre of worship to the southern portion of the hill. No reasonable deity objected to this, if only the proper propitiatory sacrifices were offered. Here comes in the question of the foundations that lie below the present Parthenon, those usually, though according to Dr. Furtwängler incorrectly, called Cimolian. It has been agreed on all hands that these foundations belong to a

temple begun soon after 480 B.C., and obviously intended to supplant the old temple, but actually never completed.

The plan of this new uncompleted temple cannot be accurately restored, but we know it to have been similar in the main to the Parthenon. In the Parthenon the idea was to have the east cella in itself a *ἑκατόμπεδος* nearly the same size as the whole old temple. The *ἑκατόμπεδος*, the incompleted Parthenon, is larger than the present building by just the length of the small chambers in the west cella of the old temple. It may be presumed, therefore, that the uncompleted temple had three chambers; in a word, that its ground plan was only an enlargement of the old temple, and was calculated to include the cults of Erechtheus and Cecrops which fell away in the Parthenon.

An important question is, who began the uncompleted temple, and when? Its foundations have usually been brought into connexion with the south wall of the Acropolis, and through this with Cimon. We have Plutarch's testimony that this south wall was built by Cimon, and immediately after the battle of Eurymedon; but no mention—in an apparently complete list of Cimon's improvements—is made of a new Athens temple. Such an omission is scarcely conceivable. Moreover, so bold an innovation as the translocation of the temple and cult to a new site was little in the manner of Cimon, but appropriate to the statesman to whom Dr. Furtwängler assigns it—*i.e.*, Themistocles. Another point—if Themistocles began the temple, the fact that the building was relinquished in so early a stage is easily explained by the fall of that statesman, by Aristides going over to Cimon's party, and the growing influence of the conservative party generally.

And here we note one of the most interesting points in Dr. Furtwängler's view: he brings matters religious into direct relation with the action of political parties. To us, nowadays, the building of churches is not exactly a party matter; but to the Greeks, intimately fused as were their social, political, and religious relations, a party policy, and the rise or fall of a cult might, *a priori*, be expected to be interdependent. Athens watched over the forward party; the conservatives clung to the ancient Erechtheus cult, and, above all, to its actual *locale*. If the daring statesman, Themistocles, moved Athens and her worship to the south part of the hill, he severed many bonds, though he dared not cut her loose from Erechtheus. When Cimon came in he gave his mind to the strengthening and beautifying of the city; he sought to make the Acropolis a fortress, but he left the innovating foundations of the new temple to lie untouched—was it likely he would complete a work begun by a political enemy?

It was not till 447 B.C. that, under somewhat altered conditions, the idea of a new temple could be again revived. The Persian War was given up; Pericles desired external peace as the necessary condition for developing internal prosperity and splendour. Rescued from ruinous war expenses, he saw in the tribute of the allies the necessary material means.

\* From plans in "Topography and Monuments of Ancient Athens" (Macmillan & Co.), by Miss Harrison and Mrs. Verrall. The plans are reduced to approximately the same scale.

\* Full references to all the inscriptions bearing on this question, as well as to the friendly controversy between Mr. Penrose and Dr. Dörpfeld in the matter of the "old Athens temple and the Parthenon," will be found in "Mythology and Monuments of Ancient Athens" (Harrison and Verrall), where the argument is stated, with plans, &c., for the use of English readers.







conception. The problem is to find a youth, a denizen of Olympus, who is in close relation to Helios, whom he faces. The solution suggested is Kephalos, the young hunter of the dawn. It is unquestionably true that Kephalos is a frequent figure on vases of Periklean date, but he appears there always in conjunction with Eos, and his solitary reclining figure does not seem wholly satisfactory.

In conclusion, we may note that what is offered here is (all that space allows) a summary of the most novel points in his argument. Without a minute examination of inscriptions it is impossible to do full justice to the case as it stands, on the question of the treasures and the opisthodomos, between Dr. Furtwängler and Dr. Dörpfeld. It seemed desirable, however, that the main positions should be clearly stated, in order that views so striking and, in some respects, so revolutionary, should be made available for English students, to whom, naturally, any question affecting the Parthenon is of special national interest.\*

#### NOTES.



SCHEME has been started which, if it succeeds, may have very important results for the decorative treatment of English architecture. This is, the foundation at Birkenhead of a Della Robbia Pottery Factory, to be worked by a company to be formed for the purpose. The object is the production of an architectural decoration in earthenware, with figure or ornamental design partially coloured and covered with a glaze or enamel capable of withstanding the effects of the English climate. The promoters, recognising the fact that the use of steam-power has a tendency to paralysed artistic development, and that this is really the cause that the work throughout the country has so little artistic merit as compared with the work produced even a century ago, intend that the principal work in this pottery shall, so far as possible, be done by hand. The company will take apprentices whereby a younger generation will be taught and trained in a practical manner, and a tradition perpetuated, and it is hoped in this way to foster the growth of a new school of architectural decoration. The pottery will be carried on by managers under the control of a council consisting of the following gentlemen:—Mr. G. F. Watts, R.A., Mr. Holman Hunt, Mr. John Lea, Mr. P. H. Rathbone, Mr. H. J. Falk, and Mr. Edmund Ware, and the services of Mr. Conrad Dressler and Mr. Harold Rathbone have been secured as managers. The company is already formed and premises secured at 2A, Price-street, Birkenhead; we do not gather exactly, from the circular sent to us, to whom application is to be made for special information; no secretary is named. The scheme has (as might be expected) the cordial support of a considerable number of leading artists and architects of this country, including Sir F. Leighton, Mr. Watts, Mr. Holman Hunt, Mr. Walter Crane, Mr. William Morris, Mr. Waterhouse, Mr. Colclough, Mr. Belcher, Mr. J. P. Seddon, Mr. Basil Champneys, Mr. Somers Clarke, and others, whose letters on the subject have been printed for circulation. Mr. Walter Crane in his letter observes:—

"I have long felt that one of the great needs as regards the external adornment of our public buildings has been the lack of *colour*, and it may be added *variety*, in modelled or carved sculptural design. Now, it seems to me that in reviving Della Robbia ware, you give splendid opportunities to both designer and colourist for producing things of beauty, which, if our architects become alive to its capabilities, will at once furnish them with the means of giving life and colour to their buildings, and of redeeming the streets of our cities from the

reproach of blackness and depression which too often under our present atmospheric conditions sits heavily upon them.

The richest stone carving in the course of a few months loses all its charescence, on which its decorative effect depends—becoming, in fact, a mere soot trap; while a vitrified material covered with majolica glazes is practically indestructible, and is washed by every shower.

Those who have seen the frieze of the Ospedale at Pistoia (a coloured cast of which is in the South Kensington Museum) know what a fine architectural effect it has upon the building of which it is a part. The sight of such a work suggests what beautiful things might again be done in the same spirit by the co-operation of capable designers and potters.

We should have a form of art which by its vigorous design, frank colouring, and dramatic capacity would be essentially popular in its appeal, while eminently educative and refining—a source of pleasure to all; and if associated, as it might be, with local or national history, either in or upon our municipal buildings, our Board Schools, baths, public libraries, town halls, what attractive places our towns might become!"

While cordially concurring in wishing success to the scheme, there is one point which we would suggest for consideration; we hope that it will not be thought an object with the managers to revive the realistic treatment of flowers, fruit, &c., in their natural colours, which is found in much of the old Della Robbia ware. We have always thought this part of the work of Della Robbia and his school distinctly unarchitectural and contrary to true decorative principles; and we hope that in the designs to be carried out at the new factory the colour element, so much wanted in our external architecture, will be obtained without reviving the practice of the realistic imitation of nature.

DURING the present week the annual exhibition of drawings submitted for the Institute prizes is being held at 9, Conduit-street. The Grissell Medal and the Owen Jones Studentship have not been awarded. The Tite Prize goes to Mr. A. R. Hennell, for a design for a Royal Mausoleum. An attractive subject was chosen for the Soane Medallion—a College for a University town—for which there are ten competitors. The successful design is by Mr. J. H. Yonge ("Nil Desperandum")—showing a picturesque treatment, Late Perpendicular in style, planned round one large quadrangle, the chapel and library forming the features at the end of the principal front, and the hall placed opposite the main entrance. A very cleverly-executed pen and ink perspective accompanies the plans, the points of the design being further illustrated by sketches on the various drawings. Of the other nine "Quien Sabe?" has a plan showing two quadrangles, the hall placed across between them, the whole treated with simple Late Tudor or Early Elizabethan detail. "Stet Fortuna Domus" is remarkable for its simplicity, and a good birdseye view of the building in brown wash. "Black Lion" has also an effective perspective of an elaborately-treated design, with two staircase towers forming features of the main front attached to library and chapel, the centre of the front being set back, with a porter's-lodge placed at a little distance in front of the main entrance. The other designs do not call for special mention. For the Pugin Studentship some excellent work has been sent in. Amongst a very good set of drawings by the successful competitor (Mr. R. S. Balfour) are a careful set of measured drawings of the Bede House at Higham Ferrers, very completely worked out, a good sketch of the picturesque Bede House at Lyddington, Northants, a measured drawing of the so-called shrine of St. Etheldreda at Ely Cathedral, with details of the colour decoration, and other sketches which are excellent examples of solid study. In the same competition Mr. Sladdin sends measured drawings of Bishop Fox's chantry at Winchester, an elaborate Late Perpendicular piece of work, showing traces of Renaissance feeling; Mr. J. P. Cooper some clever water-colour drawings of Italian subjects, and a view of the roof of the nave at St. David's Cathedral; and Mr. H. C.

Corlette measured drawings of the Belfry of St. Anastasia, Verona, with a plan of the church, and the exterior and interior of the Friari Church at Venice. Mr. J. Joass, the holder of the Pugin Studentship in 1893, has apparently spent his time in Scotland, and the work he submits is very thorough in its character. Several drawings of the Grey Friars Church at Stirling, with its imposing eastern apse, are given, and also two good ceilings from Craigievar Castle, Aberdeenshire, and the East end of Elgin Cathedral. The Owen-Jones Student of 1893 (Mr. Alfred H. Powell) has the finest examples of water-colour work in the room, particularly fine ones of a corner of the Ducal Palace at Venice; a Pulpit at Sta. Fermo Maggiore, Verona; the Interior of Sta. Croce, Florence; and Pulpit at St. Mark's, Venice. The Soane Student of 1893 (Mr. Arthur J. Bolton) has drawings—largely measured ones—taken in Spain and France, including the Giralda, Seville, the Palace of Charles V., Erandio, Burgos, a Wrought-Iron Screen in the Cathedral, the Châteaux at Blois, and de la Rochefoucauld, near Angoulême. The medal and ten guineas has only produced two competitors. Mr. J. R. Wigfull wins the prize with a useful set of measured drawings of the North Transept at Lincoln Cathedral. Altogether, this year's show well keeps up the average of these interesting annual exhibitions.

THE destructive fire at the scene-store of the Paris Opera House has only again too clearly shown us the folly of keeping the exceedingly inflammable stage decorations in, or even in close proximity to, the theatre in which they are used. No matter how a scene store may be shut off from the rest of a theatre building, the latter is sure to be destroyed if the decorations once get alight, as not even the most efficient fire-brigade can be on the spot in force with the same rapidity as a fire of canvas and tinderwood can spread, and we may even say burn itself out. Paris may consider itself fortunate that the fire in question was at least localised, as, with the exception of straw, no material will travel such distances when alight as canvas, and thus so easily set neighbouring premises alight. Paris is also fortunate in not having to close its Opera on account of a dearth of scenery, though this we believe is, strange to say, partly due to the circumstance that a certain regulation limiting the quantity of scenery allowed to be kept in the theatre itself had been lately disregarded. Of the other great opera houses of the Continent, the one at Vienna is, we believe, the only one which keeps large amounts of scenery on the premises—i.e., has dangerously extensive scene-stores in the theatre proper. The Vienna "Hofburg" Theatre, the Royal playhouses at Berlin, the Opera House at Frankfurt, the National Opera House at Budapest, and the Imperial playhouses at St. Petersburg all have separate magazines some distance away. Of these the extensive blocks in the Russian capital are certainly the most interesting. They have only lately been remodelled by the architect of the Czar's Theatre Administration, Professor Victor Schröter, and now hold innumerable sets of scenery as well as all the necessary properties and costumes. One block, for instance, always contains 135,000 costumes, 72,000 pieces of underwear, and 20,000 pieces of armour, besides all the necessary workshops; and another, again, has 1,000 pairs of "wings," a similar number of "drop-scenes," and here, again, all the necessary carpenters' and painters' workshops.

THE correspondence in the Press during the frost on the cleansing of the streets and footways has been of more importance than usual, since to some extent it throws light on the working of the law by which the Local Authorities were bound to keep the footways clean. The law certainly does not at present produce any better results,

\* See the *Journal of Hellenic Studies*, Vol. 13, p. 1, for an article by Mr. J. G. Frazer on the "Persian temple." The main question dealt with, i.e., whether this temple was still extant in the days of Pausanias, is beside our mark, but in several side issues Mr. Frazer confirms Dr. Furtwängler's conclusions, which are unknown to him.



and we fear that it is not likely to do so. Our bits of hard winter are so uncertain in their coming and in their duration that, unless the officials of a Local Authority are unusually energetic and public-spirited, they make no systematic and extensive preparations to cope with frost and snow. We see no reason to suppose that the authorities will do better in future. The advantage of making the individual householder responsible for the portion of footway in front of his house was that large numbers of cleansers could be brought into operation as soon as snow had fallen. The objection to it was the extortionate payments demanded by cleansers. If the old system were revived, this extortion might be mitigated by the County Council being empowered to promulgate a tariff for this work, and men should be liable to prosecution for charging anything above this sum. Of course, there would still be unreasonable demands, but they would not be so great as they formerly were. But if the individual householder were again made liable to clean the footways, the law should be made more stringent in regard to the carrying away of snow by the Local Authorities; if the work of the latter were diminished it should be done more effectively.

THE sculpture of Frederick the Great's time has been the subject of much criticism on the Continent, and the discussion of the subject has been latterly revived through the German Emperor wishing to follow his ancestor's example and make his reign remarkable for the works of art created at his instigation. Dr. Paul Seidl, the custodian of the works of art at the Royal castles of Berlin, now publishes some interesting details explaining how it so often happened that King Frederick's good intentions bore sad results. In alluding to the foundation of the Royal workshops for statuary (1747) Dr. Seidl tells us of the misfortune the King had in the choosing of his first "Court Sculptors." Frederick had intended to instal in that position Nicholas Sebastian Adam, the younger brother of Lambert, who had in many instances collaborated with his brother; but, practically through trickery, a third brother, François Gaspard, presented himself in Berlin and was elected to the post, although entirely unknown to fame. The latter was nearly devoid of the higher artistic qualities of his two brothers, but had at all events received an excellent technical education in Italy, destined to be of great use in the training school. The Apollo and Venus Urania, his two first works in Berlin, are like those of his brother's best style, but his later productions were tame and uninteresting. He ended his appointment by taking leave of absence, from which he never returned, dying in Paris in 1761. The second court sculptor was Sigiebert Michel (brother to the renowned Clodion Michel), appointed in 1763, and dismissed seven years later owing to conflicts with the King, due to his excessive slowness of production. There is absolutely no completed work of his extant. Finally in 1774 Tassaert was appointed—a Fleming by descent, but trained at Paris, and an exponent of the French school. His first works were four statues for the large hall of the Palace of Sans Souci (still standing in their original places), followed by monuments of Generals v. Seidlitz and Keith, executed in Carrara marble. Portraiture was, however, not his strong point. His pupil, Gottfried Schadow, was his successor; his appointment, however, being in the hands of King Frederick II.

PROBABLY a very small percentage of the persons who talk of "the triforium," whilst showing a party of friends over one of our old cathedrals, would be able to give a satisfactory explanation of the meaning of the term, if it should occur to some inquisitive young lady to ask for further information on the subject. Those who do

not wish to run the risk of having their ignorance exposed at any moment in this way might with advantage peruse the paper by Mr. Edward Bell, F.S.A., on "The Origin and Use of the Word 'Triforium'" recently published in the "Transactions of the St. Paul's Ecclesiological Society" (Vol. III.). The object of the paper is to show that the derivation given by Ducange in his "Glossary of Mediæval Latinity" is correct, and that the word "triforium" is a regularly formed one, meaning the place or passage of the three openings (*trina fores*). Parker, in his smaller "Glossary of Architecture," rejects Ducange's derivation on the ground that the separate bays of the triforium-arcade are divided into two or four openings, and not into three. But Mr. Bell is able to show by reference to the monk Gervase's account of the burning of Canterbury Cathedral in 1174, that the word was applied by him indiscriminately to the triforium and clear-story galleries, and indeed to any passage whatever constructed in the thickness of the walls of the fabric. There seems to be no doubt that the word "triforium" was used in the first instance to describe the clear-story gallery, and it afterwards became a technical term for any passage in the wall. Mr. Bell observes that "an examination of Norman churches which have retained their clearstories unaltered shows that in England at least they are generally constructed on one type, viz., with a single light on the external wall, but with three roundheaded openings into the church, on the inner face, a passage being left in the thickness of the wall, between the windows and the inner plane." Illustrations of this arrangement are given in the ecclesiastical edifices at Cérisy-la-Foret and La Trinité, Caen, in France, and at Waltham, Durham, Norwich, and Canterbury, in England. Thus it appears that the clear-story gallery was called the triforium because there were three apertures opening out of it in each bay into the interior of the church, and unless the word has some entirely different meaning quite unconnected with *trina fores*, it can never have been coined in order to describe the portion of a church now known as the triforium, because a triple aperture is as rare in that position as it is common in the clear-story. Until some very much more probable explanation can be given of the origin and meaning of the word "triforium," Mr. Bell's theory must hold the field. The other suggested derivations of the term are certainly hardly likely to be generally received. The late Sir Gilbert Scott thought the word might signify *third story*; and it has been endeavoured to trace its derivation to the Italian *traforare*, to pierce, and to an imaginary monkish Latin word *transforium*, equivalent to *thoroughfare*. Short as Mr. Bell's paper is, it is full of interest, and deserves more than a mere passing notice.

A CORRESPONDENT who signs himself "A Student" writes—

"I should be obliged if you would inform me through the columns of your Journal what are the best text-books on the various branches of sanitary science as applied to house architecture, more especially on drainage, ventilation, and heating."

I should not have troubled you, but that I think the information would be valuable to many others who may be in a similar position to myself. The student of architecture or of the science of building finds ready to his hand books which are recognized as standard authorities on these subjects; but when he comes to the allied subjects I have mentioned, he is confronted with a medley of books of doubtful merits and advocating very conflicting opinions.

The desideratum for each of these subjects would be a text-book which would explain the broad principles on which all the best systems and appliances are based, without advocating private theories or particular appliances."

As a general rule we have been obliged to notify to correspondents that "we are compelled to decline pointing out books," as at one time requests from correspondents to recommend them books on a variety of subjects became so numerous that to answer them would have been too great a demand

on our time. As "A Student" puts the question "on public grounds" and gives a special reason for putting it in regard to the class of works mentioned, we may depart from our rule and recommend the following works: On house drainage and water supply—Knight's "Annotated By-laws of the Local Government Board;" the "Health Exhibition Handbook" (1884) by Mr. Rogers Field and Mr. Eassie; and the article on "Water" in "Our Homes," by Mr. Rogers Field and Mr. Wallace Peggs. On home sanitation—"Warming and Ventilation" by Sir Douglas Galton, and the article on the same subject by the same writer in "Our Homes." On heat—a work by Mr. Thomas Box, General Morin's book (French), and Dr. Valpert's (German). Also, on hygienic subjects generally, Parkes' "Hygiene" (de Chamont's edition), and Mr. Pridgin Teale's "Dangers to Health."

THE report to the Local Government Board on the sanitary condition of the river Brent, by Dr. S. Monckton Copeman, states that the formation of the Welsh Harp reservoir has practically cut off the upper portion of the Brent. Water not needed for the Regent's Canal is discharged over a weir about 70 ft. in height into the old channel of the river Brent, and while in dry weather no water at all finds its way from the reservoir above into the river below, at times of heavy rainfall, when the flood-gates are opened, the rush of water is so great as to tear up the river bed, and often to bring about considerable diversions of the normal course of the stream. This being the case, when the water supply is scanty that portion of the river which divides the Willesden and Hendon districts is represented merely by a series of stagnant pools, and the real source of the Brent, practically, is the effluent of the Sewage Farm at Willesden. Dr. Copeman examined specimens of effluent from the various points, and in each case found the fluid to be of a dirty straw colour, turbid, containing obviously much suspended matter, and having a faint, sickly smell. Alongside the Grand Junction Canal, where this is carried by an aqueduct over the Brent and at right-angles to the stream, there are to be seen, on both sides of it, enormous heaps of London refuse, consisting of "hard" and "soft core" and of gas lime, which, to the amount of many thousands of tons, have been deposited here by contractors. At the upper level these heaps are flush with the canal towing-path; and as they are situated on either side (and practically up to the edge of) the river, the latter appears to flow through a cutting at this point. On the Brentford side numerous shallow channels, cut out in the soil, afford demonstration of the fact that a considerable, if not the greater portion of the drainage of these huge filth accumulations (which are of greater extent on this than on the Hendon side) finds its way by such routes to the stream, the waters of which thus become fouled to an extent "which it is difficult for anyone who has not actually visited the spot to adequately appreciate." Brentford is casually referred to in Spencer's "Færie Queene" as "a town of mud"; it seems under modern circumstances to keep up its old reputation.

THE report of the Surveyor's Department for the city of Belfast for the past year shows that there has been a great deal of activity in the carrying out of public improvements, especially in connexion with streets and roadways. Twenty-six streets have been widened or improved to a greater or less extent by the Department, and at seventy-five different streets works have been commenced by owners of property at their own cost, some of them completed within the year, others being still in progress. The following quotation from the Report gives also a satisfactory account of the progress of drainage work:—

"The various works in connexion with the main drainage scheme have made fair progress during



the past year. All the contracts for the Trunk System have been completed except those for the upper portion of the low level sewer from Lagan Bank-road to Ormeau-road, and the eastern branch of the low level sewer under the river Lagan, and thence to Middlepath-street. Both these sections, however, are being rapidly proceeded with, and will, it is expected, be completed by next autumn. An arterial sewer has been constructed in Shankill-road, from Beresford-street to Ballygomartin-road, and a similar work is in progress in Falls-road, between Barrack-street and Springfield-road, both discharging into the new high level sewer, thus diverting a large amount of sewage, hitherto polluting the streams, into the new system. A branch sewer has also been constructed from the low level sewer in Duncruce-street, through the Belfast and Northern Counties Railway Company's lands, and along North Derby-street and York-road to "The Grove" entrance gate, which provides an outlet for a low-lying district of the city hitherto frequently subject to flooding. The old sewers of this district have been remodelled to harmonise with the new works.

The outfall works for the main drainage system have been for several months in operation on Parliamentary lines, the sewage being discharged during the first portion of each ebb tide into the Whitehouse-roads. Duncruce-street pumping-station has been fulfilling its function the whole of the year, and that of the outfall works for some months. The beneficial effect upon the River Lagan, now that more than half of the sewage of the city is diverted from it, is very marked, and no complaint of injury or pollution to the shores of the Lough has arisen; on the contrary, reports are coming in of the improved state of the neighbouring foreshores.

During the past year the city has enjoyed an immunity from flooding, unprecedented in late years, and with the remaining extensions of the main drainage works it is hoped that still further improvements for the abatement of this evil will be effected.

WE are glad to hear that it has been decided, as a first step, to call a meeting of all who sympathise with the preservation of the City churches. This meeting will be held in St. Edmund's vestry, Lombard-street, on Wednesday, the 17th inst., at 5 p.m.\* With the object of the meeting we are, on principle, entirely in sympathy, but we hope, in the interests of the cause itself, that those who speak at the meeting will remember that there are two sides to the question; that it may not be possible to retain every existing City church, independently of any question of its architectural interest; that the present has its claims as well as the past; and that even in the interests of their own object it is bad policy to drive away moderate people by insisting in a bigoted manner on the retention of old buildings without any regard to modern necessities.

#### LETTER FROM PARIS.

A FEW days ago, in the course of the discussion of its expenditure, the Municipal Council suppressed the subvention which for twenty-three years it has granted, in the form of scholarships, to the "École Speciale d'Architecture," founded in 1865 by M. Emile Trélat. This step is the more noteworthy inasmuch as, the preceding week, the Conseil-Général de la Seine suppressed also the position of Architect-in-Chief to the Department, filled by M. Trélat, so that the proceeding almost looks as if it arose from personal hostility to an architect whose opinions are not calculated to render him a *persona grata* to a Republican Government. It is probable, however, that these decisions have nothing to do with political feeling. In regard to the "École Speciale," the Municipal Council seems to have been only adopting a perfectly just position in regard to a paying school, which is in quite a different position from the École des Beaux-Arts, where the instruction is entirely gratuitous. With M. Trélat the course of studies lasts three years, and absorbs the whole time of the students, who, at the end of it are subjected to an examination, on passing which they are dismissed with a diploma certifying them to be "architectes hygiénistes," which sonorous title is regarded generally as of rather doubtful value.

At the École des Beaux-Arts, on the contrary, the course of studies lasts twelve years, sometimes more; but while following this course the students can also carry on work under practising

architects, and thus go through a practical apprenticeship which, while enabling in part to earn their living, fits them also much better for the actual work of life than a merely theoretical education. And if we consider the results obtained by the "École Speciale" in the period comprised between 1871 and 1891, while we find ninety-four scholarships, contributed to by the municipal authorities to the extent of 166,000 francs, twenty-six only of the holders of these are now known as architects, and of these, fifteen have thought it necessary also to pass the course of the École des Beaux-Arts. In refusing to continue the subvention granted for so many years the Municipality has practically expressed its opinion that the teaching at the "École Speciale" is of much less value than that given at the École des Beaux-Arts.

At the same sitting of the Municipal Council on financial expenditure, the question of the completion of the Boulevard Haussmann came up again. Many of the members demanded a vote for this purpose in consequence of its importance in regard to the future universal Exhibition; but in spite of the promises made by the Administration, and the urgent representations of all those who understand the necessity of completing the work, it is probable that this main road, which begins at the Arc de l'Etoile and traverses the richest quarter of Paris, will remain cut short near its junction with Rue Talbott. It is difficult to understand the reason of this delay, which can hardly proceed from mere economy, since several large financial bodies have offered to advance the necessary funds for the work of making the road and for the necessary purchase of house properties.

In spite of a good deal of reasonable opposition from various members, the Council has before its recess voted definitely for the installation of the artistic collections of the city in the Pavillon des Champs Elysées. As this pavilion—not in any case very fit for such a purpose—is included within the site of the 1900 Exhibition, the procedure of the Council is rather imprudent, inasmuch as the whole of the constructions for that Exhibition will be made the subject of competition which may possibly result in the suppression of all the existing constructions on the site, in order to provide something entirely new.

It is announced that there is shortly to be a competition, instituted by the Government, for designs for a new type of postage stamp. It is to a deputy of Paris, M. Mesureur, that we owe this initiative of a reform the utility of which is very doubtful. According to the expression of the honourable member, it is desirable to "Republicanise" the French postage stamp, to substitute for the present allegorical device, which has been in use since 1876, a new allegory which cannot apply to any other form of government, but which will properly and specially typify the political ideal of modern France. The programme, however, leaves full liberty of choice to the competitors; so that we may conclude that the author of the movement has himself found it difficult to give any precise definition of what he wants. We do not expect much from the result of this competition, which is to be decided some time in the course of the present year. As allegories go, the present device, representing Commerce and Industry as supporters to the globe, is as good as any they are likely to get. Monarchical countries escape this little difficulty, as they have only to put the reigning sovereign's head on the stamps. But it is rather difficult to symbolise such an abstract entity as republicanism, and "the head of the Republic" does not seem to impress our artists very much. Fourteen years ago the municipal government of Paris also wished to create a typical bust of the Republic, which was to be affixed to all the public monuments and on the walls of public meeting-halls, &c. A competition was opened for this, in which the best-known artists of the day took part, but the results were so poor that the competition was cancelled. Since then, whenever an effigy of the Republic is to occupy the place of honour, which, though not perfection, has the merit of being found less bad than any other. Perhaps it will be much the same with the future postage stamp design.

For some days past the Bank of France, very much cramped in the historic hotel which it occupies in the Rue de la Vrillière (built by Mansard in 1620), has installed its archives and its "Service des Titres" in the old Theatre Italien, once so well known under the name of the Salle Ventadour. All this large building has been totally transformed, and the Service des Titres, which holds property to the extent of four

milliards of francs, occupies one half the house to the height of four stories. Throughout all this portion of the buildings the stone walls have been lined with iron, making a kind of immense strong room, divided into three parts by glass floors. The doors of this unique muniment room are closed by hydraulic power, and only a single staircase gives access to the interior. The portion of the building facing the Avenue de l'Opera is reserved for offices and public rooms.

A good many artists' exhibitions of various kinds have been held recently in the Georges Petit Gallery in the Rue de Sèze, where the sale of the pictures of the late painter, Cabat, was recently held. Two ceramic artists, M. Dalpayrat and M. Lesbros, have just exhibited conjointly a series of works in stone-ware and other varieties of ceramic ware, including realistic representations of fruit, animals, &c., finished with a surface and colour which are pleasant to the eye, but very destitute of invention. Next comes the annual exhibition of M. Edward Lachenal, one of the earliest and most fervent apostles of the revival of ceramic art in France. He exhibited this year a fine collection of vases and plaques of varied profiles and decorated with floral ornament, and some very fine restorations of ancient Persian faience, and some beautiful enamelled work. Not long after we had an exhibition by two landscape painters, MM. Jacquin and Ogier, to which succeeded an exhibition organised by a certain number of lady artists and offering very little interest. We may mention also an exhibition which a group of new impressionist painters organised in the Rue Lafitte. It had only a "succès de curiosité," and the public showed perhaps, by its indifference, a pretty accurate estimate of the real value of the eccentricities offered to it by Mm. Bissaro, de La Rochefoucauld, and others of their school.

The Luxembourg has reopened its doors after having received some important new works, among which are the studies of Meissonier purchased by the State, and those given by the son of the painter. We shall shortly see there also the fine portrait of Cardinal Laviege by M. Bonnat, which had been sent to Chicago. A small new room, situated on the ground floor of the museum, has been reserved for drawings, etchings, engravings, and lithographs, by modern masters. M. Bracquemard occupies an important place here; and the exhibition, though at present very incomplete, is an interesting addition to the museum; but for some odd reason, while the public are allowed free access to every other room in the museum, a special card of admission is necessary to penetrate into this one.

M. Bonnat, whom we have just referred to, has been unanimously re-elected president of the Société des Artistes Français. MM. Cavellier and Daumet are elected vice-presidents, MM. de Vieillefroy, Thomas, Coquart, and Baude, secretaries, Mr. Tony Robert-Fleury reporting secretary, and M. Boisseau treasurer.

We are glad to be able to announce that M. Cavellier the sculptor, is recovering from the effects of the bad fall he met with a short time since, and which it was feared at first would have serious results; and in spite of his great age, the energetic artist expects soon to be at work again.

#### THE NEW GALLERY EXHIBITION.

A MORE detailed examination of the exhibition of Early Italian Art at the New Gallery entirely confirms our first impression, that it is one of the most interesting and valuable loan exhibitions held in London for a good many years back. From an artistic point of view, however, it is so more especially in reference to the objects of decorative art which form a large proportion of the show. The pictorial portion of the exhibition is, no doubt, very interesting in a historical sense, but it must be admitted that in regard to a great many of the pictures the interest is more historical than artistic. It may be observed also that in this portion of the exhibition the nominal limit implied by the title has not been strictly maintained. One cannot accept examples of Raphael, Leonardo, Luini, and Andrea del Sarto as representing "Early Italian Art," and it would have been more logical to have been content with rather fewer paintings and kept within the limits of the programme.

We shall devote our necessarily brief comment to the decorative work rather than to the paintings, as being both in reality the best portion of the exhibition, and also the one most directly connected with our subjects, since decorative art is governed by precisely the same aesthetic laws as architectural detail. In this portion of the collection nothing will perhaps be

\* It is requested that all who are unable to be present, but whose sympathies are with the preservation of the City churches, would write to Mr. C. Talbot Rotherham, 10, Billiter-square-buildings, E.C.



found more interesting than the collection of "Personal Ornaments" and work of a cognate description contained in case C in the west gallery. The most remarkable object here is a large rock crystal vase (404) of the sixteenth century (we may ask again whether that is strictly "Early Italian art"), the large crystal bowl beautifully engraved in arabesques, the mouth an eagle's head and the handle a dragon, both decorated in gilding and coloured enamel. This is as sumptuous a work as could well be seen. Another crystal vase, and a hanapin of crystal (the latter from the Spitzer Collection) are also worth attention, though far inferior to the first-named work. Another gem in this case, of much smaller dimensions, is the small reliquary (407) said to have belonged to Catharine of Braganza, consisting of the cylindrical portion of an arm bone, mounted in hoops of gold and enriched with translucent enamels of singular beauty and purity of colour. This cylindrical portion, about 3 in. long, is hung with chains as if intended to be used as an ornament. Another perhaps still finer work in the purely artistic sense is the long belt (475) with circular silver mounts enamelled and nielloed in the most beautiful and delicate conventional floral designs; one of the most perfect works of art in the gallery. The enamelled gold necklace and pendant (471) "of Cellini work" as the catalogue gives it, set with pearls, diamonds, and rubies, is, when considered as a personal ornament (as it evidently was intended to be) most remarkable for its sumptuous character and high relief in the settings; a kind of ornament only to be worn by an empress or a queen on a grand occasion. A collection of finger-rings, tent, like some others of the best articles in this case, by Mr. Frederick Davis, have been mounted, apparently with the desire to show the richness of the precious stones with which they are set, in such a manner that all the rest of the ring is nearly out of sight of the spectator; a mistake. What one wants to see is the design as a whole; and the mere value and perfection of the jewels with which it is set, and which forms the centre-point of the design, cannot be properly appreciated unless we see the whole ring. These are apparently a collection of beautiful works of their kind, and we hope they may be rearranged before the exhibition is over, so that one may have a better chance of studying and admiring them than we can have under the present merely "jeweller's" arrangement.

Case D of "bronzes, crystals, &c.," in the same room, contains among other things a number of very fine keys, two especially, "steel keys of a cassone" (541-2), which might well be studied by some of the people who design ceremonial keys for the opening of museums and other institutions, and who seldom seem able to turn out a decent piece of art, or even in general to escape the ludicrous. One great value of this exhibition might be, if the opportunity were made proper use of, to create among our art-workers a perception of something better than the things they are in the habit of turning out; but we fear little use will be made of it in this way. Those who go to admire and study work of this kind are generally those who already know the value of good design; and it can hardly be hoped that the designers and artisans who really contrive and make the ceremonial keys and caskets will take serious trouble to improve so long as they know that they will get no credit for any improvement in their work; that their personality is hid behind that of the man who sells it, and that he would infinitely prefer that they should make what would sell best than what would please the most cultivated perception. Among other things in the same case we may draw special attention to the silver scent-case (No. 513), a bit of work of Oriental richness and delicacy. There are some fine examples too of that old Florentine art of coloured wax relief, which a clever lady artist has been reviving for the past two or three years in the Royal Academy sculpture room; especially two very fine and expressive miniature heads in high relief, representing "Hell" and "Purgatory" (536).

In the case of bronzes, E, our attention was at once attracted by one of the smallest and least prominent exhibits, a circular plaque of about 4 in. diameter, a mirror back, with an alto-relief (579) of a bacchante, the style of which at once bespeaks a great artist, and one is not surprised to read in the catalogue the name of Donatello. It is worth more than anything else in the case, but must be looked for, except by those whose eyes have been quickened to pick out great art on a small scale. The other contents of the case are

"good bronzes," of more or less interest; a bronze bust of a boy, of the "School of Donatello" (560) is of a rather exceptional character. Case G, of metal plaquettes, contains much that is interesting; case F contains some interesting statuettes and wood carvings, including a very expressive marble bust by Tacca. Case A in the west gallery contains some fine examples of church plate, especially an "incense boat and spoon" (287), a silver-gilt chalice (302) of the normal character but exceptionally good in design, and a super-altar (303), a slab of jasper set into oak, the border ornamented with scrolls, and with figures on medallions at the corners symbolising the four elements. This is said to be a late twelfth-century work, and is both artistically and archaeologically of great interest.

In the north gallery the most interesting case (H) is that of ivories, in which one of the most interesting objects is not of ivory but of bone, a very curious semi-Byzantine-looking pastoral staff, conjectured to be of the thirteenth or fourteenth century, and very exceptional in style. We are informed in the catalogue that other pastoral staffs of this type exist, and are believed to have been peculiar to North Italy (the catalogue says "other croziers," as if a crozier and a pastoral staff were the same thing, which they are not). An "ivory Florentine casket" (782) and an "inlaid bone casket" (797), though in different materials, are so similar in design as to seem almost like pendants; the design is curious from its singular quasi-architectural treatment; the lid and stand form a strongly-marked projecting cornice and base; there are flat pilasters at the angles, and between these, along the sides, is a series of semi-cylindrical projections, like stumpy columns without capital or base, the surface of each of which is carved with figure subjects in relief. Among the prominent objects in this case are an ebony writing desk (776) with a profusion of small and delicate arabesques in inlaid ivory, interspersed with small oval plaques with engraved figure subjects, a most beautiful piece of work; and a little ivory needle case (804) carved with a chariot and horses on the side in low relief, and with a naive character which half suggests Japanese work. There are many other pretty works of art in this case, though none perhaps quite equal in interest to those we have mentioned. In the case of bronzes (J) in the same room, a seated figure of "Charity" (838) not of bronze but terra-cotta, is noticeable for a beautiful simplicity of composition and expression. In case K are four musical instruments which have both artistic and historical interest.

The central hall is rich in fine work of different classes. A case (N) of superb majolica work stands in the centre, flanked by two cases (O and P) containing some very fine specimens of arms and armour, prominent among which (case O, No. 1,177) is a superb russet steel shield, repoussé and damascened, with a panel in the centre containing a fine figure subject, a seated figure and a standing soldier, with a tented background. In case P the back of a gorget (1,191) is noticeable for its fine but reserved ornamentation. Among the majolica were referred to just now is a plate (1,132) with a subject of Hercules and Dejanira, which is of interest because the pose of the figures is exactly the same as that in a sketch by Michelangelo given in Symonds's recent work; a woman seated on one knee of a man, with one leg thrown across his other knee. The similarity of motive is so decided that one is inclined to think there must be some connexion between the two designs.

A large case of embroideries facing the entrance contains some very fine work; nothing so fine in an artistic sense (though others are richer in effect) as the credence cloth (1,232) in gold embroidery and coloured silk which is laid in the centre of the lower case, over which, in curious but rather picturesque and suggestive combination, a stray rapier is laid. Among other objects in the central hall are to be noticed two alto-reliefs of St. John the Baptist, by Donatello (1,285 and 1,288), alto-reliefs, that is to say, in Donatello's peculiar low-relief fashion, as one may call it; but are they both by Donatello? No. 1,285 certainly is; the other is not very like Donatello's work in general, nor, as compared with its pendant, does it strike one as by the same hand. It is a curious-looking work, a white marble half-length figure cut out and detaching itself strongly from a dark ground; the general effect is rather odd, but the face on close inspection is very finely modelled. Here, too, is Donatello's exquisite bas-relief (genuine bas-relief) in slate of St. Cecilia (1,305), which was seen a few years ago at one of the Burlington House loan exhibitions. A very fine cabinet of Milanese work (1,258), of architectural design and richly

ornamented with figures, damascening and arabesques in gold and silver, is a splendid piece of work in the finest taste; the ebony cabinet (1,291) once belonging to the Medici family, which forms a pendant to it, is an example of splendid workmanship rather than fine taste, enriched as it is with designs of flowers and birds in inlaid marbles, and as realistic as the material will admit of. In the matter of furniture the glory of the exhibition is also to be found in the central hall in the shape of the magnificent ceremonial throne of Giuliano de Medici, carved by Baccio d'Agnolo in the early part of the sixteenth century. The history of this is briefly given in the catalogue, and it is said to be perfectly well authenticated. This is a seat long enough for half-a-dozen persons to sit comfortably on, and ample in depth, with a lofty back with carved pilasters dividing panels which are inlaid with arabesques in light wood on a darker ground; the front beneath the seat is similarly treated. It is one of the finest state seats in existence; pity a better man did not sit in it.

The centre cases in the north gallery are devoted to illuminated manuscripts, containing a great deal that is well worth looking at; we can only mention two, the coronation of the Virgin, by Fra Angelico (case T), an exquisite piece of work both in general effect and details, and a volume of miniatures of various schools (case V, 1,325), of which the one exhibited formed part of a Tuscan choir-book of the fifteenth century, and contains beautifully-executed figures of the Evangelists. In the balcony is a fine collection of examples of printed books, a number of which illustrate the taste for a proportioned series of margins, with the inner margin towards the middle, which Mr. Morris and others have revived; and while there is no doubt that the effect of this arrangement is excellent in a decorative sense, many of these volumes also serve to illustrate the criticism which we made at the time of Mr. Morris's lecture at the Arts and Crafts Exhibition viz., that however well this arrangement may look, it is not the most convenient for reading from in a bound book. In many of these volumes the result is that the inner part of the page is always on a slant with regard to the plane of vision, and it cannot be read with the same ease as the rest. Among the examples we may call attention to the folio Cicero (No. 1,397, A.D. 1498) a noble page; the first edition of the Divina Comedia (No. 1,400), and "No. 1,418" printed at Verona in 1472, and said to be the first dated book with wood-cuts executed in Italy. Two of the engraved pages are open, and show large cleanly-executed outline cuts of fortifications and military engines. The balcony contains also some fine specimens of studies by old masters, some of them of great interest.

We can only bestow a few passing words on the pictures. The south gallery is devoted to the earliest works, and includes a good many interesting examples of the strictly decorative work of the early schools of Florence and Siena, paintings in which the gilding is as important as the colouring, and in which we see, as Browning says,

"Angels with aureoles like golden quoits  
Pitched home."

The room contains one beautiful Giotto, the "Coronation of the Virgin" (16) and an "Assumption of the Virgin" by Angelico (23), where she hovers over a tomb full of flowers. An anonymous painting of the Florentine school, "The Virgin and Pope Leo IX." (53) is fine and interesting, the figure of the Virgin looking unexpectedly modern in style.

In the west gallery are two interesting works of Luca Signorelli, the "Marriage Feast of Perithous and Hippodameia" (91), and the sequel of the fight of the centaurs and Lapiths (97). The treatment of the architecture in these and other paintings in this gallery is of interest. In No. 91 we have square columns, black, with decorated panels in lighter tones, the frieze and the wall spandrels above also black, the bases, capitals, and archivolts mouldings red. In Botticelli's episode of the feast in "The Story of Nastagio degli Onesti" (156), we have the same square pillars with gilded Corinthian capitals, an arcade in perspective on each side of the feasters, and a triumphal arch of the Roman type in the rear. In his "Death of Lucretia" (160) we have a more elaborate and more distinctly classical triumphal arch as a background, in which the capitals and bases are of bronze ungilt. There are several fine Botticelli's, the finest being the "Virgin and Child and St. John" (134), and "The Holy Family" (108). Ghirlandaio's "Portraits of Count Sassetti and his Son" (105)



is a powerful work as a portrait, and interesting also from the elaborate treatment of the landscape background, with its mountains and sea, and the carefully-worked-out perspective of the winding roads in the middle distance. Filippino Lippi's "Departure of the Argonauts" (112) is a fine piece of colour, and the man in armour on the caparisoned horse in the foreground is splendid. In the North Gallery we come to later masters, including Leonardo and his imitators Luini and Solario, who are grouped together. We cannot say that the Leonardo's raise one's enthusiasm much. Andrea del Sarto is represented by a charmingly-grouped academical composition of the "Virgin and Child and St. John" (214), poor in colour, and another "Virgin and Child" (232) in which "the perfect painter" is seen quite at his best; the sentiment is poor, but the execution beautiful. Various Raphaels exhibited are more or less unsatisfactory, and one or two looking very doubtful; the "Virgin and Child," belonging to Mr. C. Butler (254), is a fine example of an often-repeated motive, and the profile bust portrait of a young man (256) is interesting and fine in colour, which latter is certainly not the case with the curious processional composition of "Christ bearing the Cross" (242). Two or three small Correggios scattered about the room are very happy specimens of this painter's devout prettiness. Generally speaking, however, it is not the pictures which will form the great attraction of this exhibition.

#### MAGAZINES AND REVIEWS.\*

*Harper's* contains an archeological article of some importance, by Mr. Boscawen on "Egypt and Chaldaea in the light of recent discoveries," on some of the most recent discoveries in the latter neighbourhood which throw light upon the early connexion between Egypt and Mesopotamia, long anterior to the great period of Egyptian temple building. The discoveries dealt with are those of M. de Sarzec, and some of the illustrations are exceedingly interesting and significant, especially the plans of cylindrical brick piers discovered among the remains of the city of Gudea, and which look, as Mr. Boscawen says, like the attempts of a brick-building people to imitate the quadruple-reeded pillars of early Egyptian architecture. The article is well worth the attention of those who are interested in the history of architecture. Mr. Edwin L. Weeks contributes an article on "From Isajahan to Kurrachee," including illustrations of the architecture as well as of the human types to be met with on the way.

The *Century* commences with a short pleasantly-written article on Frans Hals by Mr. T. Cole, with two or three illustrations of the painter's works. "Life in a Lighthouse" by Mr. Gustav Kobbé, is a spirited and well-illustrated attempt to enable the reader to realise the circumstances of lighthouse life, together with a description of the fate which befell the first American lighthouse and some of its occupants in a gale.

In *Scribner* we meet again with Mr. E. L. Weeks, as illustrator this time not of his own but of another man's writing, that of Mr. F. Marion Crawford, who contributes his concluding paper on "Constantinople." Mr. Hamerton contributes a critical article on Manet, in which he does not ignore the shortcomings of that eccentric and self-willed painter. The plain truth, he says, "is that while some of Manet's work was strong in style and harmonious in colouring, a good deal of it was very crude, and this seems to have been due to his habit of improvisation." One of Manet's convictions was that the colour ought to be left fresh without tormenting the life out of it with the brush; but, as Mr. Hamerton says, if the colour is not of very good quality when so left, the mere freshness and crispness of touch are not a sufficient compensation. Our own impression is that the idea that art can be an improvisation is one of the most false ideas that was ever propounded, and that works thus quickly produced will as quickly die. Art means hard and painstaking effort after perfection, and nothing really great or permanently effective has been or will be produced otherwise. "Stories in Stone from Notre Dame," by Mr. Theodore H. Cook, has little to do with the subject, which is mainly the grotesque "devils" of the Paris

Cathedral, the most powerful of which Meryon first made famous, and a number of which are here produced from photographs. We learn that a good many of these are copies made under the eye of Viollet-le-Duc, the old ones having begun to decay beyond hope of preservation; this takes away a little of the interest from the subject, though perhaps it was better to preserve them in copies than to lose them altogether. It is to be hoped the weather-worn originals are carefully preserved. The worst of it is that (unless a careful record is kept) these copies will in course of time, when themselves weather-worn, possibly be taken for originals. *Scribner*, which is very artistic in its contents this month, also includes a very pleasantly-written and sympathetic article on Reynolds, by Mr. Frederick Keppel. It is satisfactory to find that, in their fashionable depreciation of most things in English art, and exaltation of everything French, the American critics are not yet so wrongheaded as to begin to write down Reynolds, as they have attempted to write down Turner.

The *Idler* contains an illustrated article on "The Folks' Play in the Tyrol," the historical play of which Andreas Hofer is the hero, and which is, it appears, played on Sundays in autumn and winter at Meran, once the capital of the Tyrol.

The short article in the *Cornhill* on "Military Ballooning" is of practical interest, and an article describing a visit to the extinct volcano of the Caldera in the island of Palma is very well written and gives a vivid idea of the scenery.

In the *Gentleman's Magazine* Mr. Stewart's article on "Old Edinburgh Inns" revives some interesting recollections of the inns of old days, and if the *Gentleman's* admitted illustrations there would be plenty of scope for pictorial illustrations, which one rather misses in connexion with such a subject. However, we are by no means disposed to wish that every magazine should introduce illustrations, because experience shows that there is a sad tendency in such cases for the illustrations to entirely get the better of the literary matter, and for the magazine to be reduced to a mere picture-book with nothing in it worth reading; and after all, one does want some reading in a monthly magazine, and not a mere collection of ever such clever engravings "written up to" by sensational story-writers and article-mongers, which is too often the case now.

In the *National Review* Mr. Edwin Cannan undertakes to show by figures and statistics the probability that there is now a decline in urban immigration. It is high time there should be, so we hope that his figures are correct. He sums up with the conclusion that, except in the case of a few of the most prosperous towns, the influx from the country districts is nearly or completely outweighed by the efflux to the rest of the world, and that the complaint that the urban labourer is dragged down by the competition of rural immigrants is ill-founded. Mrs. Crawford's article on "A Tour in North Italy" is interesting, but political rather than artistic or landscapey. The writer mentions one circumstance to show that the advertising mania is not confined to this country. Near the "Devil's Bridge" she encountered "the biggest hoarding in the world," which covered over a jutting crag with a huge pictorial illustration of the virtues of a soap which in a single wash had cleansed one side of a chimney-sweep's face. Mrs. Crawford mentions having met with the advertisements of the same soap on Norwegian fjords, and "the trunks of the plateane trees which shade the long high road from Milan to Monza are corkscrewed round with long bills declaring that no soap on the face of the globe is equal to Sapola Soap." When is the world going to rise up against this kind of thing?

In the *Contemporary Review* Professor Cunningham makes the hopeless attempt to give logical consistency to the phantom called a "living wage," which he defines as "that which will enable the ordinary man to maintain the standard of comfort of his class," admitting different standards of comfort for different classes. We wonder how many men, of any profession, would contentedly acquiesce, on this theory, in the statement that they had a living wage. "Each," says the writer, "has a pretty definite idea of what he means by being 'able to live'; there is probably an implied reference to the habits in which he has been brought up." Just so, and the struggle to keep up to this standard is one of the incentives to steady and energetic work; but according to the "living wage" theory this standard is to be kept up for him. The practical influence of such a system would be in the long run absolutely demoralising.

And then, on Professor Cunningham's way of putting it, we must have a "living wage" established for all classes, in proportion to "the habits in which they have been brought up"; the Professor's argument must necessarily lead him to that; a consideration which is in itself enough to indicate the preposterous nature of his reasoning. Mr. Emerson Bainbridge's article on the "Coal Strike of 1893" is a more wholesome and practical one, and sums up in an impressive manner the list of mistakes which led to a movement by which every one has lost and no one has gained.

In the *Pall Mall Magazine* Lord Ernest Hamilton writes a diatribe against London smoke, but without offering any solution of the question beyond a stray remark about anthracite and other smokeless kinds of coal (of which there is not a sufficient supply for general use on economical conditions), and the equally vague remark that there are several means of getting over the difficulty. He does settle down at the end on the suggestion that the ultimate solution will probably be found in gas for fuel instead of for lighting. This is the most promising speculation that can be made, but papers consisting of so much talk and so little practical suggestion do not help the cause much. Mr. Mallock contributes a paper in a rather eccentric strain on "The Minimum of Humane Living," but which is practical in its essential tendency. He endeavours to show that the maximum wage for a large proportion of the population cannot be more than can be obtained from the cultivation of the worst class of soil that can be cultivated at all; that this is a much lower income than is enjoyed by most of the labourers in other occupations who are demanding a "living wage"; and that to take these lowest wage-earners off this bad land in order to give them more profitable employment can only result in losing so much national wealth by leaving the worst land uncultivated and losing its produce. He proposes to show in another paper how the cultivators of the poorest soils may earn larger incomes by improvements in industrial methods. The article is, at all events, a welcome exception to the Utopian and illogical manner in which the subject has in general been treated recently.

In the *Fortnightly* "The Ireland of To-morrow" by "X." is a thoughtful article on the present economical state of Ireland and its possibilities of improvement. In an article on "The Employment of Women" Miss Bulley deals with the conclusions to be gathered from that report on "Women's Industries," to some portions of which we have already referred in a special article. Professor Judd's article on "The Chemical Action of Marine Organisms" is an explanation of the manner in which minute organisms affect the materials which are held in solution in sea-water. Under the head of Correspondence "X." makes some heavy charges in regard to the present mismanagement of the Irish railway system.

The *New Review* presents its readers with the first example of its promised use of illustrations, not as a means of making a popular picture-book, but as a means of illustrating serious articles which require the assistance of illustration, in the shape of an article by Professor Max Müller on "The New Museum and the Sidon Sarcophagi," with some very good separate page illustrations reproduced from photographs. This kind of use of illustrations—the scientific use, as we may call it—is a new departure in a shilling magazine, and it is to be hoped it will meet with the success it deserves. Mr. E. H. Bayley, M.P., in an article on the question "Is Our Lifeline system effectual?" suggests that there is much mismanagement and much room for improvement, and that a Royal Commission on the subject is called for. A very piquant article by Mr. Walter Crane, "Some Impressions of America," is also illustrated by reproductions of small pen sketches by the author. The article (which is to be continued) is partly political and social, partly artistic. In regard to the latter side of the subject, Mr. Crane thinks that architecture is in a better condition than any other art there, as we should think probable; though "it suffers," he adds, "from the oppressive modern conditions, necessity of taste [we do not quite appreciate the meaning of that]—the contract system, and the preposterous scale on which architects are called upon to design their business buildings." This latter condition, however, is regarded by some American architects and art-critics as their best opportunity. The following is his description of the manner in which the suburbs of Chicago are made:

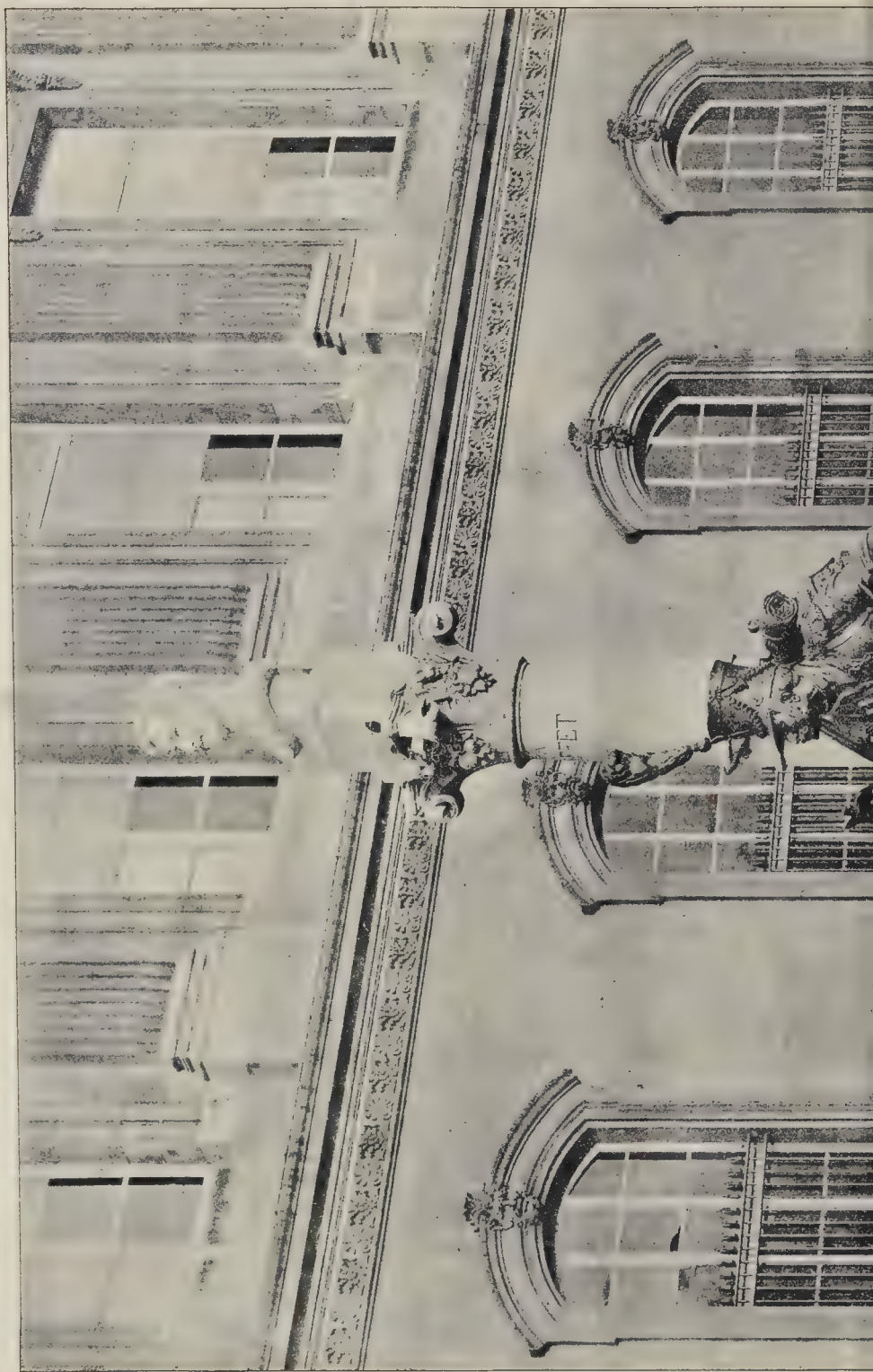
"A long, broad, straight road is made, crossed at right-angles by others. They sometimes break off short on the prairie—to be continued when it pays,

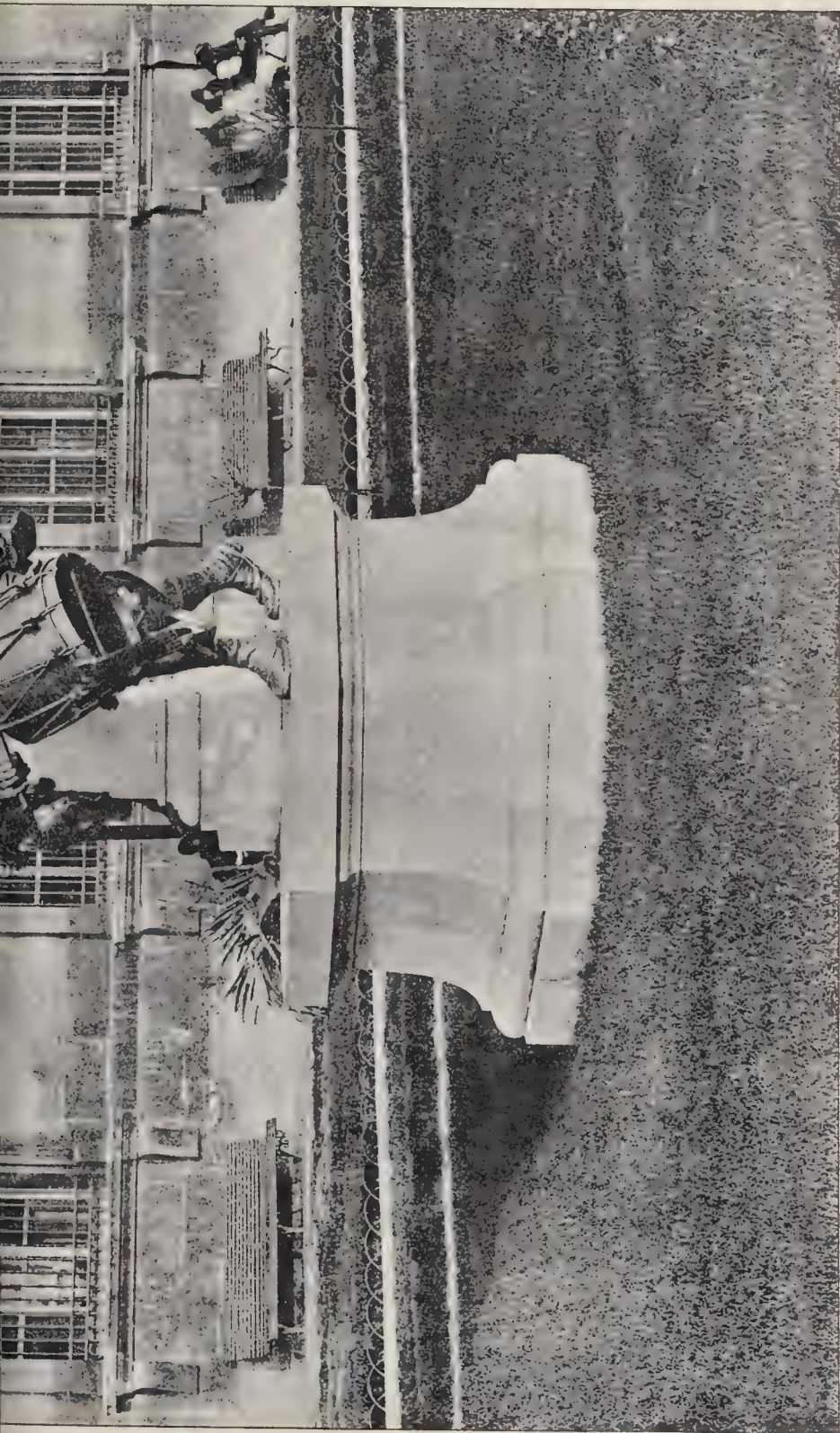
\* The object of these notes is to point out anything in the contents of the current magazines which is of special interest to our readers, who are generally of criticism on the views expressed in such articles. When a magazine which has been sent to us is not noticed, it is because that number contains nothing that it is within our province to comment upon.





THE BUILDER, JANUARY 13, 1894.





MONUMENT TO RAFFET, THE MILITARY PAINTER, RECENTLY ERECTED AT PARIS. M. FRESNET, SCULPTOR.





Along these straight roads are planted at regular intervals exceedingly irregular houses, often fantastic, the enterprising genius of the American architect and builder (perhaps English after all) breaking out in weird, conical towers, vast verandahs, mansard roofs, or loop-holed structures of undressed stone. The main roads to the town are bordered with huge telegraph poles, or trees, of rough timbers, carrying masses of wires. Vast, dull, red structures, like Brobdingnagian Noah's Arks, rise on every hand by the wharves in and about the city. There are the grain elevators, where the grain is stored, and hoisted up from or run into the barges at the wharves beneath them."

In the *Art Journal* the title of "The Great Master" is given to an illustrated article on Rembrandt, an assumption we cannot quite concur in, though he is certainly one of the greatest. Mr. J. M. Swan's admirable genius as an animal painter is illustrated by some fine drawings of his work accompanying a notice by Mr. R. A. M. Stevenson. In the studies for animal sculpture it would strike one that Mr. Swan was rather consciously imitating Barye. Mr. Day, in a short article on French Decorative Art in London, observes truly that the French are strong where we are weak, and weak where we are strong.

The *Magazine of Art* heads its number with a fine photograph by Dujardin, from Mr. Burne-Jones's admirable "Glorious picture," the "Chant d'Amour." An article on M. Puvion de Chavannes and his works by Prince Karageorgewitch will be of interest to those who know the painter's work well, and useful to those in England who do not. Mr. William Morris contributes some notes on the illuminated books of the Middle Ages, with two illustrations in black and white. Architectural subjects are represented by an illustrated paper on "Italian chimneytops," by Mr. T. E. Tidmarsh.

The *Studio* devotes an article to "photographic portraiture," based on an interview with Mr. H. Hay Cameron, and devotes a great deal of space to the Birmingham School of Art, with a number of reproductions of drawings by its students which are very interesting and show that the spirit of art has some rest for the sole of its foot in Birmingham.

In the *Architectural Record* Mr. Goodyear continues his illustrated studies on "The Lotiform Origin of the Greek Anthemion," which he appears to mix up with the Ionic volute in an attempt to get the same origin for both. In the Egyptian origin of the anthemion we quite concur, though it reached Greece by way of Assyria and with much modification *en route*; but this derivation for the Ionic volute appears a forced one. The *École des Beaux-Arts*, beloved of Americans, is the subject of an illustrated article by Mr. Ernest Flagg.

The *Journal of the Royal Society of Antiquaries* of Ireland includes papers on various local antiquities, including one by Mr. Frazer on "Early Pavement Tiles in Ireland."

In the *Antiquary* we have No. 1 of "Notes on Armour in the Tower," by Viscount Dillon, "Churches in Kent in 1806," by Mr. Arthur Hussey, one on "An Early Norman tympanum in Cornwall," by Mr. A. G. Langdon.

The *Reliquary* contains an article on "The Pre-Conquest Churches of Northumbria" by Mr. C. Clement Hodges.

The *American Architect*, in an extra number commemorative of the Chicago Exhibition, publishes a very fine set of collected illustrations of the buildings of the exhibition.

**ASPHALTUM IN SICILY.**—According to a recent report of the United States Consul-General at Rome, it is only necessary to distil asphaltic rock and to obtain petroleum, which confirms the opinion of a French scientist, M. Coquand, to the effect that asphalt is petroleum in a solid state, which, rising in the form of vapour from the depths of the earth, had instilled itself into the fissures of calcareous rock. Asphaltic rock is chiefly found in the district of Syracusa, near Ragusa, known as *Renzana*, or pitch country, where there is a tableland of great extent, the stone of which is sawn and used for chimney-pieces, doorposts, and staircases. The stone is very easily cut and carved, but where it contains too much asphalt it gums the saw, and has to be sweated or exposed to heat to rid it of the excess of bituminous matter. Belonging to the Miocene formation, this rock is in immense heaps in the midst of molasse, which tends to prove that the petroleum was deposited in it at the very moment that the rock was formed.

**PARTNERSHIP AND CHANGE OF ADDRESS.**—Mr. Arthur Baker has removed from Lower Phillimore-place to Effingham House, Arundel-street, Strand, and has entered into partnership with Mr. John Turill, the style of the firm being Messrs. Baker & Turill.

## ROYAL INSTITUTE OF BRITISH ARCHITECTS.

The fifth general business meeting of the Royal Institute of British Architects was held on Monday at No. 9, Conduit-street, Regent-street, the President (Mr. J. Macvicar Anderson) in the chair.

The annual exhibition of drawings submitted for the prizes and studentships was on view in the large gallery. The following is the list of prize-winners:—

*Essays.*—Institute Silver Medal and 25 guineas, awarded to Mr. John Begg; Medals of Merit: to Mr. C. Bernard Hutchinson and Mr. Walter K. Shirley; and hon. mention to Mr. Percy Charles Campbell.

*Drawings.*—Institute Silver Medal and 10 guineas awarded to Mr. James R. Wigfull. Drawing: North Transept of Lincoln Cathedral.

*Travelling-Stud ut-ships.*—Soane Medal and 10 guineas (for Continental travel), awarded to Mr. James Humphreys Tongue; Medal of Merit and 10 gs. to Mr. R. S. Dods; Medal of Merit to Mr. George S. Hill; and Honourable Mention to Mr. Henry Mitchell.

*Figure Studentships.*—Medal and 40l. for travel within the United Kingdom, awarded to Mr. Robert Shekleton Balfour; a Medal of Merit and 5 gs. to Mr. Hubert Christian Corlette; and a Medal of Merit to Mr. John Paul Cooper.

*Geddis Bursary.*—Silver Medal and 40l. for travel outside the United Kingdom to Mr. Harry Percy Adams.

*Owen-Jones Studentship.* (Certificate and 50l.) not awarded.—(Drawings sent in by Arthur Thomas Bolton and Thomas Rogers Kinsell).

*Title Prize.*—Certificate and 30l. (for travel in Italy) awarded to Mr. A. R. Hennell.

*Griswold Gold Medal* (one competitor only) not awarded.

## COMPETITIONS.

**LLANDOVERY GIRLS' INTERMEDIATE SCHOOLS.**—In the recent competition for the Girls' Intermediate Schools at Llandoverly, the plans of Mr. J. H. Phillips, St. John's-chambers, Cardiff, were selected by the assessor, Mr. Ewan Christian. The Committee has instructed Mr. Phillips to proceed with the work.

**PUMP ROOM COMPETITION, BATH.**—At the adjourned meeting of the Bath Town Council, held on Tuesday at the Guildhall, Mr. Railway moved:—"That the authors of the three premiated designs be asked to enter into a further competition. That fresh instructions be prepared by Mr. A. Waterhouse, R.A., or other approved architect, and the set of drawings selected by him, as assessor, be accepted by the Town Council." Mr. Mitchell seconded. Mr. Hallett subsequently moved the amendment of which he had given notice, "that the author of the first premiated design for the Baths Extension Scheme be requested to carry out the work as architect, subject to modification of his design to be made in consultation with Mr. A. Waterhouse, R.A., under the approval of the Council." Mr. Mallett, in seconding, said the amendment was the only practical way out of the muddle into which they had been led. His objection in the first place to "K" was because with the magnificent concert-room which was provided he thought the expense would be greater than that of "O's" plans, but he found that the work would cost 300l. less. In fact, the only serious objection to "K's" plans was the way in which the Roman Alderman Marshall asked a question, the effect of which was what veracity they would have that "K," supposing the amendment was carried, would amend the plans to meet the wishes of the Council? Mr. Hallett replied by reading the letter which the President of the Royal Institute of British Architects had addressed to the Chairman of the Baths Committee, to the effect that in these competitions plans were often recast in the consultation of an architect with his clients. Upon a division there voted, for the amendment 21, against 25. The amendment being lost, the resolution was put, and lost, on a show of hands, by 22 votes to 16.

**A SCHOOL OF ANIMAL PAINTING.**—It is proposed by Mr. Frank Calderon to open a school of animal painting in April next, if a sufficient number of pupils are forthcoming. Mr. Briton Rivière, and two or three other well-known animal painters, are, we are informed, interested in the scheme. Intending pupils can address to Mr. Calderon at 26, Carlisle-road, Hampstead.

## ARCHÆOLOGICAL SOCIETIES.

**ROYAL SOCIETY OF ANTIQUARIES OF IRELAND.**—Mr. Thomas Drew, R.I.A., President of the Royal Institute of Architects, Ireland, and a member of Council of the R.I.B.A., was, on the 9th inst., elected President of the Royal Society of Antiquaries, Ireland, in succession to Lord James Butler, deceased.

**BRITISH ARCHÆOLOGICAL ASSOCIATION.**—At the meeting of this Association, held on the 3rd inst., Mr. Ch. H. Compton being in the chair, an interesting series of drawings was exhibited by Rear-Admiral Trendett, of the Celtic Tumulus of Mont St. Michael, Carnac. The mound is wholly artificial, and it consists of a mass of stones piled around a chamber roofed with stone, the whole being covered with a layer of clay, thick enough to prevent entrance of water. It stands nearly east and west, and a small ancient church is built on its summit, where are also a cross and the ruins of a semaphore station. Mr. Loftus Brock exhibited a series of lamps which have recently been found at Jerusalem and its environs by the operatives of the London Society for Promoting Christianity amongst the Jews. They are variously ornamented, one having a curious pattern of palm branches. They are of pre-Christian date. The chairman exhibited a wall tile of Delft ware, most notably made at Malines, obtained from an old house in the City of London, recently demolished. A paper was then read on the Roman altar which has recently been found at Lanchester. It was prepared by the Rev. Dr. Hooppell, and read in his absence by Mr. W. de Gray Birch, F.S.A. Photographs of all sides of the altar were exhibited. The altar has recently been set up for preservation within the porch of Lanchester Church, not far from the place where it was found. A second paper by Mr. F. H. Williams was then read on an ancient crypt, which has recently been opened out for observation in Crypt Court, Chester. The new buildings have been arranged by their owner, to admit of its preservation. It is of fourteenth-century date and groined with transverse and diagonal ribs. The Deputy Mayor of Chester, Mr. C. Brown reported the clearing out of a crypt of late Norman date, on his property, close to the above, which he is having repaired.

## ENGINEERING SOCIETIES.

**THE INSTITUTION OF CIVIL ENGINEERS.**—At the ordinary meeting of the Institution of Civil Engineers on the 9th inst., Mr. Giles, President, in the chair, the subject of the "Concentration and Sizing of Crushed Minerals" was dealt with in a paper by Mr. Robert E. Commans, A.M.Inst.C.E. The author first referred to the object of concentration, which was to remove impurities with which minerals were associated, and to render them marketable. He then enumerated the several stages of hand-picking, crushing, and dressing, through which the minerals had to pass. The first two operations were briefly dealt with. Handpicking underground was carried out in order to avoid raising more waste rock than was absolutely necessary, and to pick out the very rich lumps to prevent them from being knocked about and broken. Owing to lack of light and the limited time at the men's disposal, this form of separation was naturally of a rough character, and was usually followed by more careful handpicking on the surface. When large quantities of coal had to be examined horizontal endless belts were generally employed. These were composed of steel plates, or wire netting, and had a width of 4 ft. to 4 ft. 6 in. When travelling at a rate of 40 to 50 ft. per minute they had a capacity of 30 to 40 tons per hour. Revolving picking-tables were mostly used for ore, the pickers sitting round the periphery. To keep down the dust from the ore which had been previously crushed to about 1½ in. size, it was washed with a spray of water. These picking-tables had an outer diameter of 10 ft., and a width of 20 in., and revolved at a rate of from 30 to 40 ft. per minute. For reducing lump-coal prior to mechanical separation, fluted or toothed rolls were commonly employed. The first operation, after crushing, was the careful sizing of the material. This was usually performed by means of screens. Cylindrical screens were mostly used for sizing coal, and nearly exclusively for ore, as this was invariably fed into the screens in a moist condition and washed during the operation of screening by a spray of water. A brief consideration of the principles underlying the sorting or separation by gravity of



particles in water was next given. Jigging-machines, on account of their great simplicity and large capacity, were more used than any other form of apparatus for sorting, not only the comparatively coarse crushed material, but also the fine. In conclusion, separation by pneumatic, centrifugal, and magnetic agency was referred to.

**JUNIOR ENGINEERING SOCIETY.**—At a meeting of this Society, held on the 5th inst., an interesting lecture on "Boiler Incrustations and Deposits" was delivered by Professor Vivian B. Lewes, F.I.C., F.C.S., Honorary Member. The lecturer pointed out the serious injury occasioned to boilers, and the waste of fuel due to the formation of incrustations, traced the history of various sources of water supply, and showed how the water acquired the power of forming deposits in steam generators. These deposits consist mainly of calcic carbonate, calcic sulphate, magnesian hydrate, and silica, the chemical processes which led to their deposition in the feed-water differing in each case. Examples were given of scales from various waters, and it was shown that fresh water incrustations may be looked upon as consisting chiefly of impure calcic carbonate, whilst the deposit formed by the use of sea water is principally calcic sulphate. Brackish waters give incrustations consisting of nearly equal portions of these substances. The question of anti-incrustators was dealt with, and the lecturer expressed his opinion that if manufacturers were obliged to use a hard water, the most reasonable method they could adopt was to soften it on a large scale before putting it into the boiler, as otherwise serious complications would arise in the boiler itself.

### Illustrations.

#### MONUMENT TO RAFFET, PARIS.

**T**HE monument which has been recently erected in Paris to the memory of Raffet, the military painter, is entirely the design of M. Frémiet, the sculptor, who in this case has, contrary to the usual custom in France, undertaken the design of the pedestal and decorative accessories as well as the sculpture.

The monument, which was paid for by public subscription, is erected in the garden known as the "Jardin de l'Infante," which runs along the colonnade of the Louvre, and terminates near the vaulted passage opening from the Court of the Old Louvre, opposite the Pont des Arts and the Institut. It is in this garden also, but on the side of the Place du Louvre, that the equestrian statue of Velasquez by the same sculptor has been placed.

The bust and the column are in white marble; the figure of the drummer beating the "charge," and the military accessories (cuirass, muskets, sword, and flag), are in bronze.

We may add that it is proposed to commission from M. Frémiet an equestrian statue of Rubens for the same site, to form a pendant to the Velasquez statue.

#### ST. JOHN'S COLLEGE, HURST-PIERPOINT.

The additions of the tower and ante-chapel here shown will complete the College Chapel, of which, at present, the nave only is built.

The tower is 28 ft. square and 112 ft. high. In its lower stage are three lofty arches opening into the nave and the ante-chapel, and in its western wall is the principal door; the foundations were laid in 1892.

The Chapel itself, which was built some years ago, stands on the north side of the principal quadrangle. It is 122 ft. long, 37 ft. wide, and 70 ft. high to the ridge of its open-timber roof.

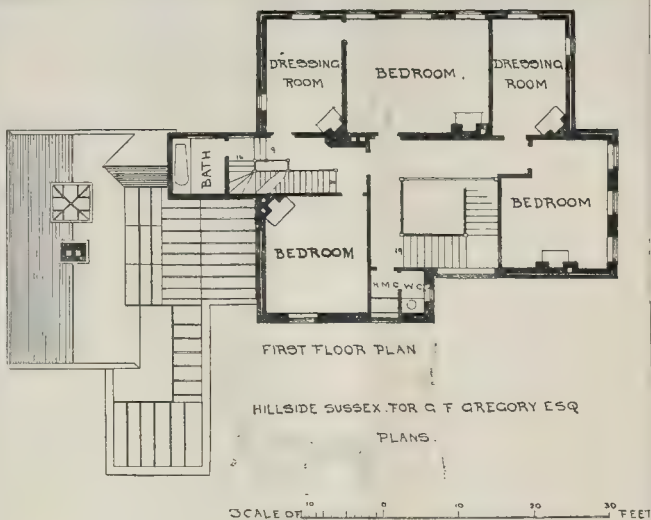
The oak stalls and seats replacing the previous temporary fittings are just finished, the boys' seats face north and south; at the east end of the southern stalls is the canopied seat of the Visitor, the bishop of the diocese.

The building shown on the left of the picture is the end of the great dining-hall.

The cloister, also an addition, is only one story high, it runs in front of the hall and chapel, and gives a covered communication between them and the north and south sides of the quad.

The works are being carried out from the designs of the college architects (the late R. H. Carpenter and B. Ingelow).

The view we give is a reproduction of a drawing in last year's Royal Academy Exhibition,



#### SKETCH DESIGN FOR A MARKET HALL.

This drawing shows the front elevation of the market hall, which was one of the subjects given for competition for the 10<sup>th</sup> premium amongst students of the Royal Academy.

In the *Builder* for December 16, we referred to this design as being especially good amongst those submitted for this subject. The author is Mr. H. Seton Morris.

#### "HILL SIDE," NEAR ETCHINGHAM, SUSSEX.

This house was built in 1892-93 for Mr. George F. Gregory. The materials used are local red brick, gauged red brick arches, and local stone for the plinth, quoins, and copings, red tiles for roof, with lead flat and lead cupola to the kitchen.

The total cost of the house, exclusive of stables, was 2,670<sup>l</sup>. The contractor was Mr. F. Piper, of Hawkhurst, Kent, who carried out the work from the designs, and under the superintendence of Mr. Reginald Blomfield, M.A., architect, of London.

#### PULPIT, ROTHERHAM CHURCH.

The pulpit in the Parish Church of All Saints', Rotherham, which we illustrate this week, was constructed in or about the year 1630. It is of

black oak, richly carved, and is one of the finest of its class in the country. The illustration is from drawings made by Mr. H. L. Paterson, A.R.I.B.A., of Sheffield.

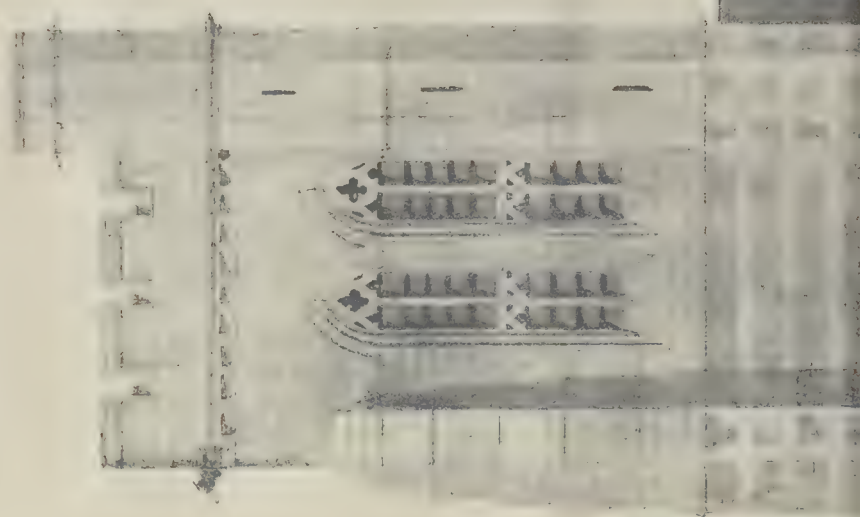
**LIVERPOOL ANNUAL EXHIBITION.**—The Liverpool Annual Spring Exhibition of Pictures in Oil and Water-colours, Decorative and Applied Art (under the management of the Liverpool Academy), will be held in the Walker Art Gallery during the months of February and March. Works for exhibition must be delivered at the Gallery, unpacked, on Monday, Tuesday, or Wednesday, the 15th, 16th, and 17th of this month. Further information, including the names of local agents who will unpack and deliver works, can be obtained from Mr. Charles Dyllal, curator, Walker Art Gallery, Liverpool.

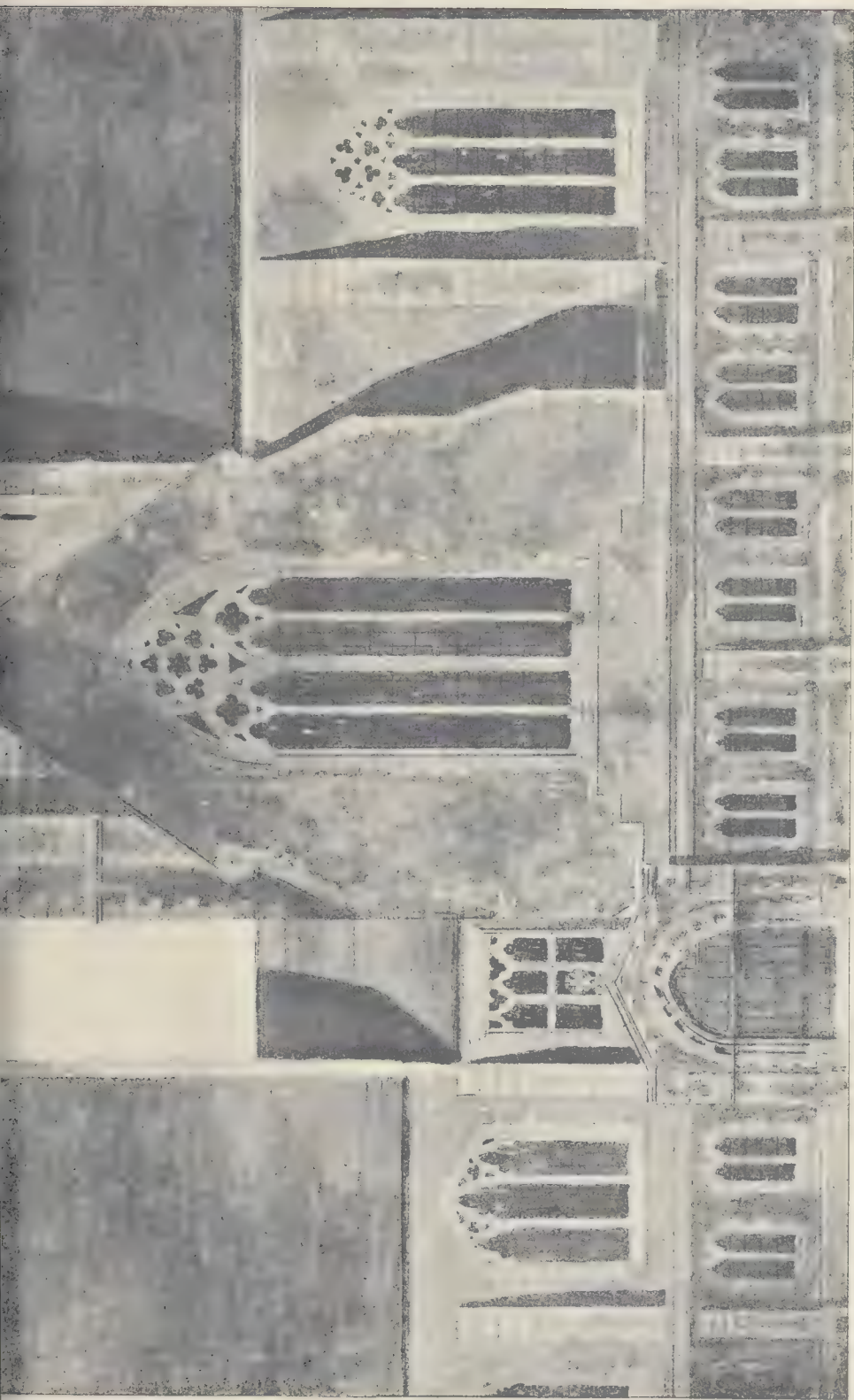
**"UNREASONABLE DEMANDS OF ARTISANS."**—In reference to a letter under this heading which appeared in the *Builder* of December 9 of last year, we have received a rather informal communication, signed with initials "G. M.," only, purporting to come from the Westbourne Branch of the "Amalgamated Society of House Decorators and Painters" (dating from the Cobden Club, Kensal-road), and stating that "at a branch meeting" (we presume of the branch just named) "a resolution was passed repudiating the action of the workman in the case referred to, thinking that such actions have a detrimental effect to our cause, that of drawing us closer together." We may be glad, if this rather informal statement is genuine and *bona fide*, that even one branch of the House Painters' and Decorators' Society can see that.





THE BUILDER, JANUARY 13 1894.





ST JOHN'S COLLEGE CHAPEL, HURSTPIERPOINT (THE TOWER AND ANTE-CHAPEL).—MESSRS. CARPENTER & INGELOW, ARCHITECTS.











Elevation.

*Alfred Marshall*

50 5 93

Scale of Feet 0 10 20 30 40



First Floor Plan.



Second Floor Plan.



SOUTH-WEST VIEW.



SOUTH-EAST VIEW.

THE PHOTO SPRAGUE & CO. 48, NEWINGTON ROAD, LONDON, S.E. 11.

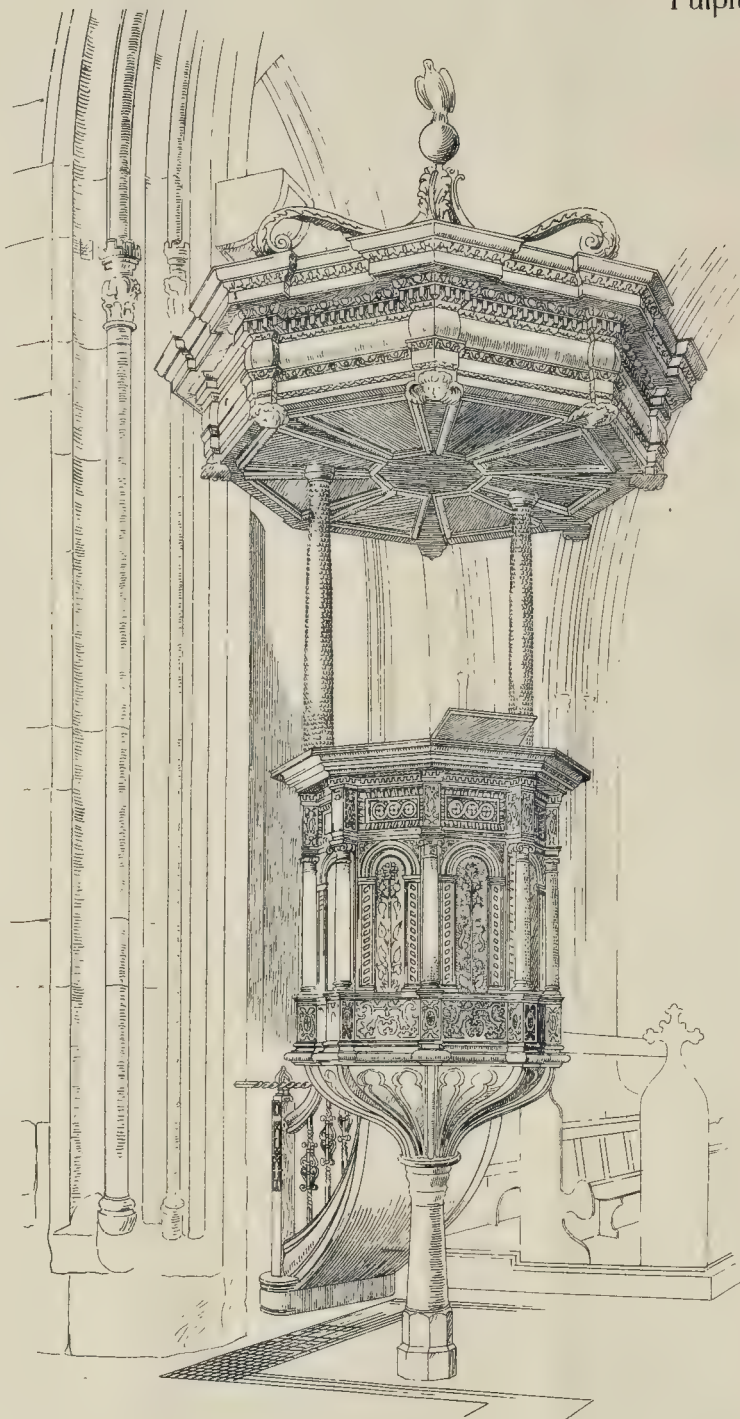








## Pulpit in Roth

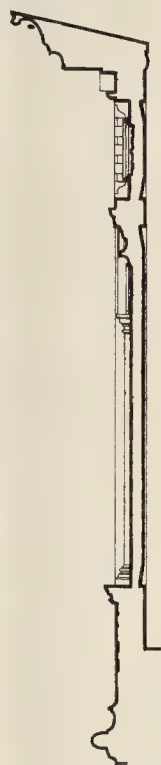


drawn by H.L. Paterson  
1893

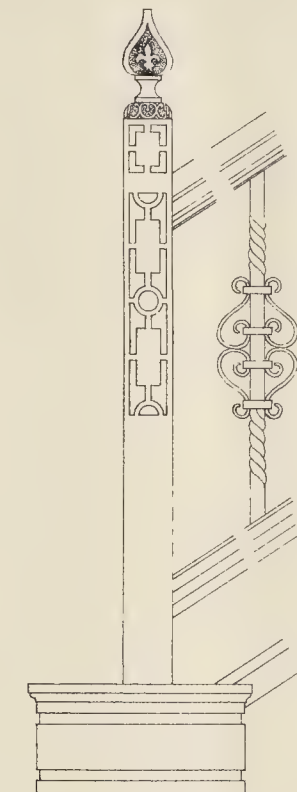
# Irish Church



Elevation of Front



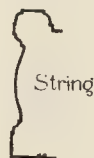
Section of Front



Details of Stair



Handrail

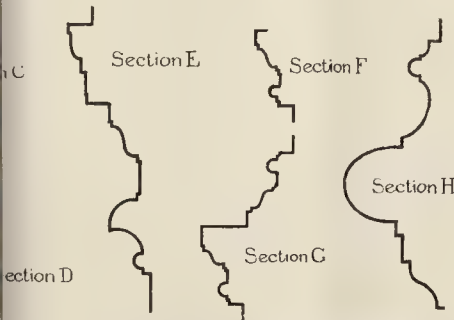


String

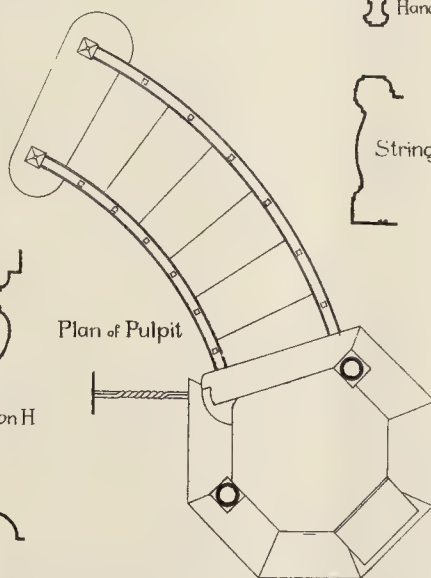


an at A

Plan at B  
looking up



ection D



Plan of Pulpit



measured and drawn by  
H. I. Paterson 1893





# THE ARCHITECTURAL ASSOCIATION : DIFFICULTIES OF A YOUNG ARCHITECT.

THE fifth meeting for the present session of this Association was held on the 5th inst. in the meeting-room of the Royal Institute of British Architects, No. 9, Conduit-street, Regent-street, the President, Mr. E. W. Mountford, in the chair.

The minutes of the previous meeting having been read and confirmed, the following gentlemen were elected members of the Association:—Messrs. R. A. Hinds, C. W. Surrey, F. H. G. Fothergill, W. W. Farthing, and W. H. Ward. Mr. Owen Fleming stated that he had proposed to move the resolution with regard to the technical education of workmen, of which he gave notice at the last meeting, but in consequence of the Committee desiring to consider the matter further before bringing it before the general body, he had, in deference to their wishes, consented to allow the resolution to stand over to that day fortnight.

The President said that he ought to explain that what Mr. Fleming had said about the Committee desiring to consider the matter further before bringing it before the general body was quite correct. It was not that they had any feeling against the resolution; quite the contrary. All they wanted was to have the opportunity of considering the matter further before laying it before the meeting.

Mr. A. O. Collard then read the following paper

## On Difficulties of a Young Architect.

The persuasion of the Honorary Secretaries of this Association, and their suggestion of a title, has led to the preparation of a few notes on some of the numerous difficulties which beset the young architect. I hope that other friends will relate their own experiences, and thus add to the general stock of information. In this way our junior members will learn some, at any rate, of the troubles they may expect when having shaken off the chains of pupillage, and the perhaps harder serfdom to follow, they take upon themselves the full responsibility of private practice. I hope, too, that our younger men will not hesitate to join in the discussion, as the subject is one peculiarly their own.

The nature of this evening's paper renders direct illustration on the screens almost impossible, but that void is admirably filled by the pictures we are so accustomed to see around these classic walls. What better object-lesson could there be than the noble gallery of portraits of so many leaders of our art, who, in spite of difficulties, some harder to contend with than any we are likely to meet, have risen to the highest rank of our calling? An honest ambition to try to do as well should animate the breast of every young architect, who will be none the worse for hoping his own portrait may, one day, be added to this distinguished collection.

I am not sure at what period an architectural student first considers himself entitled to put the word architect after his name, nor does it much matter, as his friends and the public generally succeed in finding out, and learn in time to distinguish very well between his claims and those of such people as the West-end sweep, who actually painted the word architect on his sooty signboard because of his duties in connexion with chimneys.

It is scarcely needful to dwell at any length upon the pupillage stage, except perhaps to remark how few article apprentices seem to realise at the time that their future largely depends upon how they employ their time and opportunities when they are young, and that if they waste either it will be terribly hard to make up leeway afterwards. Those are fortunate who, having a natural bias towards artistic things, succeed in entering a good office, and have in other respects congenial surroundings, an able master, and associates willing to impart information. They are less to be pitied, if unsuccessful, than others less fortunately situated, whose commencement may contribute to a similar result, through uncongenial surroundings, with small opportunity of receiving that artistic nourishment which is sometimes so lamentably absent. Not that I consider an indifferent office is necessarily bad for a beginner, for at any rate he would probably learn some things very useful in after life, and if he is worth anything at all he will soon find out for himself what is lacking and make up the deficiency. That is the easier nowadays, since we are surrounded with the means of acquiring the groundwork of architectural knowledge, of which the new curriculum of this Association is, by some, considered the best.

The time wasted by many pupils is fearful, and they, more than their principals, are responsible

for it. Pure laziness is the cause of it, I am afraid, though that evil is not, I fancy, so apparent as it used to be.

The life of the improver and the assistant, two stages which some youthful geniuses strive to evade, and in a few cases successfully, though with eventual good to themselves I doubt, are not so bad as many make out. Salaries, it is true, are small, but not more so, I believe, than in most other arts and crafts nowadays, and the opportunities for improvement and gaining experience are many. It is frequently not till a student becomes a wage-earner that he fully discovers his weaknesses, and it is at this period he generally makes great strides in the profession he has adopted. My advice to all pupils on completing their articles is to try very hard to get into a good office, a few of which they will by that time have learned the whereabouts. If they wish to some day practise on their own account—and who do not?—avoid like a penal settlement the chance of an appointment in some public department. The salary may be attractive, but the monotonous routine saps the energies and lessens the once strong desire to fight a way in the world, and gain such measure of success as devotion to his work should bring to a young man. If one can judge from a recent advertisement issued by a public office, the gilded bait is not quite so attractive as it was, for an estimating and measuring clerk is offered 250*l.* a year, while an architectural draughtsman is to be tempted with 2*l.* a week. A good introduction, a few really good specimens of draughtsmanship, and perseverance in spite of rebuffs, will usually gain the entry to a desirable office, such means being perhaps preferable to those used by an assistant in America, who when he was out of work and hard up, walked into an architect's office and successfully demanded employment, his two chief recommendations being a thick stick and a fierce bulldog.

Various reasons may cause a draughtsman to take the plunge into private practice—a desire for emancipation, the offer of a private job, the fact of being out of a berth, having won a competition, or a solid confidence that work will tumble in, if only the brass plate is fixed up. Or he may gradually accumulate friends and clients while still working all his time, or part, with another architect, sharing an office meanwhile with some intimate friend; this latter arrangement giving him frequent chances of talking over knotty questions with someone he is not too shy to consult.

At any rate, having determined to make a start, say in London, the choice of an address is by no means unimportant. The convenience of clients should be a consideration and first thought, and the effect of even an easily-remembered postal address need not be overlooked, nor the abbreviation, if necessary, of the too many Christian names or initials with which some thoughtless parents provide their offspring.

Having made a start, however clever an architect may think himself, time, and time only, can bring that ripened experience which enables a man to grasp a subject easily and quickly, and grapple with the difficulties successfully which scare a person of small experience. I would say to all beginners, when in doubt or difficulty which you cannot exactly see through, go at once to an older practitioner, and gain from his ample store of knowledge the information you require. I believe it will be found, without exception, that our elder brethren cordially render every assistance to those who seek their advice.

To attempt to bluff a client with pretence of knowledge, or Pecksniffian fudge as it is sometimes called, is little use, so if you don't know, go to some one who can tell you.

Various kinds of architectural work are before you, and those are lucky who can pursue the particular kind which their taste prefer, or their skill and education enable them to tackle best. Circumstances or accident may, to the easily led, dictate a particular class of work, but, on the other hand, any one who firmly resolves to strike out in a certain line, will, in time, probably gain his desire. Church work, public buildings, theatres and music-halls, schools, houses great and small, in fact any building with a roof to it, have their attractions and require special study. There are those who find competitions suit their tastes, a form of speculative excitement which may be distinctly objectionable to others, though it would do even the latter no harm to occasionally have a throw at the architectural dice. Success in competitions, however, seems to be to the few specialists, and the steady jog-trot of private practice has sufficient variation for most men. Having in the course of my comparatively brief

experience only gone in for one competition, though that was a success, I am not in a position to say anything on the subject generally, and I will leave it to others present to point out the difficulties in connexion with this branch of work, and to give some valuable tips in dealing with public committees and boards, the chief, and perhaps the only point impressed on my mind, being the necessity of having an appointment made under seal, to insure payment for services rendered.

While clients are few, and jobs far from numerous and remunerative, there is the chance that some older or more fortunate friend may have more to do than he can comfortably manage himself, or in his own office, and may hand some of it over to his needy and thankful brother-T-square, who need have no reason to be ashamed of taking in washing.

Speculative work, that is to say preparing plans for a building to occupy a certain site, for which building you might also have to find a builder or other person willing to lay out capital, is thankless work, and I believe disagreeable from beginning to end. You may very likely have your work for nothing, or even if the building is eventually erected from your drawings, you may have little or no control over the builder, who when he has paid your fees, proceeds to carry out the design as he pleases, and may so distort it, that like Queen Victoria when she once drove past Buckingham Palace, you may inquire "What building is that?"

The manner of obtaining work seems to rest a good deal with the man who wants it. The possession of private means does not insure it, nor does exceptional brilliancy always do so. To sit in an office, and expect work to roll in by some automatic process, is to expect too much in these times of keen competition and over population. As a rule, the young architect has to seek work outside his office by making his wants and abilities known among his friends and relations. The more of these he has the better. To make friends comes naturally to some people. I have heard that teaching in a night-school is labour in this direction not thrown away, though I do not speak from personal experience. Many forms of sport and pleasure, the social or political club, devotion to one's future welfare, the filling of public offices, the frequent use of the voice and pen in debate and controversy, all these and many other methods are employed with advantage. The Press is found by some to gain them the object they desire, namely, notoriety, and even the House of Commons occasionally has a contribution from our ranks. The preparation of pretty pictures for the walls of the Royal Academy gives employment to many of our most skilful draughtsmen, though it is a lamentable fact, the public do not yet seem thoroughly to appreciate the attractions of the architectural chamber. The various building journals give a wide circulation to much work that is good, and when it is so, it is warmly welcomed and appreciated. It would perhaps be well if the editorial censorship were more strictly exercised, though, on the whole, young architects might have a new difficulty to contend with if a tribunal or arbitration board had to decide these matters of taste instead of an editor. I would say to young contributors, consult a few intimate friends before you publish designs, for you, of all people, may be the least competent to estimate the quality of your own efforts. I have briefly referred to a few modern ways of obtaining work. Before passing from this branch of our subject, it may be refreshing to remember some architects who have done, or who are still doing, much work and good, without wishing or needing to attract attention beyond the ever-increasing circle of their *clients*. The name of one architect, now, alas, dead, suggests itself, who was scarcely known to his fellow-craftsmen, who never published a sketch or drawing, numerous and admirable as they were, breathing the soul of a true artist, but who, nevertheless, enjoyed a very large practice among the best of clients, and lived the most retired life imaginable. Under such conditions, good results seem more possible than in the case of an architect rushing hither and thither, never happy unless immersed in public functions, and mentioned in the papers. One point is worth passing reference here, and that is the necessity of not becoming an architect for the mere purpose of earning a living. No more disastrous reason could be chosen, and if that is the sole reason that animates any young architect, he had better by far change his vocation. There are other callings where that object is the only one that need be seriously entertained. You will remember what Professor Garnett said in this



room a few weeks ago, when speaking of workmen. That "the man who worked under the pressure of dire necessity to provide the means of nature for himself and those depending upon him, was little better than the slave who worked under the slave-driver's whip. He only was a free man who did his work because he delighted in it; and who did his work as well as he possibly could, because he would have thought it disgraceful to do it in any other way." It would be well if this statement of affairs could be clearly impressed on all who propose to devote their lives to the study and practice of architecture.

The doing of work which, by degrees, finds its way to a beginner's office, is our next consideration. It covers the preparation of drawings, writing specifications, drawing up contracts, interviewing clients and tradesmen, inviting and advising as to tenders, and last, but certainly not least, the carrying out of the approved designs, with the subsequent settlement of accounts. Securing the confidence of a client and enabling him to see that his confidence is well placed depends largely upon a promptitude in grasping his ideas and requirements, and if necessary, directing them. A client comes to the architect with more or less acquaintance with his own wants, but as a rule, expecting that knowledge to be supplemented by the skilled advice of the expert. He expects to be protected from mistakes of all kinds, and to him inconceivable dangers. Too much patience cannot be displayed in pointing out what is undesirable, and what impossible. Having come to a full understanding, sketch plans of the proposals can be prepared, a preliminary plan of the site having been made, levels taken, &c.

A thorough knowledge of materials and construction, of the relation of the proposed building to its surroundings, and the tastes of the owner, a thorough comprehension of all legal enactments likely to affect the building—and these are sometimes neither few nor very intelligible—site, aspect, drainage, and other things, are necessary to the young architect to enable him to complete a design which shall be a credit to him as an artist and man of business and give his client satisfaction. If these conditions be fulfilled, our youthful genius should, for the time being, be a happy man. This period of the work, if an architect be fond of his pencil and brush, is perhaps the pleasantest, and the many hours constantly spent in sketching, measuring, and studying, will all add to the enjoyment of his drawing-board. When, after sundry consultations and revisions of his plans, a scheme is finally approved and the word given to proceed, the designer has to put in operation the practical part of his attainments, by writing such a specification as will properly describe and explain all that is shown, required, and intended by the drawings, for the building they represent. To many this is an irksome job, but it should on no account be relegated to other hands; the architect alone has had the advantage of personal consultations with the client, and the architect alone knows, or should know, what is wanted, and is responsible for the result. Too much time and attention cannot be devoted to details, to ensure successful results, and great pains spent thus at the beginning, saves endless difficulty, annoyance, and very likely additional expense at the end. For instance, drawings should give as much detail and general information as the scale to which they are drawn allows. It is no use making them too pretty, or highly finished, for the builder understands or appreciates little of that. What he wants is a clear set of drawings, neatly figured, with the different materials distinctly shown by colour. The same principle applies to specifications, which, to my mind, are generally too elaborate and wordy. I think it would be very useful if some talented specification writer were to prepare and publish a few terse, every-day sets of specifications, and thus enable some of us to abandon the antiquated forms we seem to cling to so lovingly. The two trades which beginners stumble over most are, I fancy, the joiner and plumber. A few weeks spent in the shops would soon set this right. Going to another profession for an illustration of the advantage of studying things in detail, we may reflect on Mr. Hart's recent article on the late Sir Andrew Clark, in which he remarks that his illustrious friend "never slurred a point in any case, and never passed over a detail which suggested itself to him as being capable of elaboration for the benefit of his patient." With us, a client places both himself and his money in our hands, and the responsibility is on us. In doing the work, therefore, that a commission entails the young architect is naturally

bound to devote his whole heart, soul, and brains to it, not sparing himself.

In carrying out work, the beginner may find himself rather at sea. If that be so he had best spend as much time as possible on the job, watching keenly all that goes on, making friends with the workmen, whom he will find as friendly as possible if rightly treated, and willing enough to tell all they know. Do this from the moment the first spit of earth is removed till the last coat of paint is applied. Although it is, perhaps, a little rough on a client, it is a first rate thing for a young man to act as a clerk of works for a time. He will learn a tremendous lot and never regret it.

As pupil and assistant we are brought to see many difficulties which occur in dealing with builders, tradesmen, and clients. But to the young architect these difficulties become far more real, and have a more depressing and depressing effect.

Builders, as a rule, expect to find young architects easy to manage, open to persuasion by emphatic reference to practical experience, and disconcerted by the evasion of some things which they think it safe to omit, or too far gone to rectify. Firmness at the commencement of a job will impress such builders as these, and the condemnation of a bad load of bricks will have a wholesome effect. Reflection on any point which seems doubtful, will enable the beginner to decide what is right and proper to be done. All builders are not like this, fortunately, but when you come across a really good one, do not lose sight of him. One case occurs to me where a builder having submitted a sample brick for some walling was warned not to use them. He thereupon remarked that at all events they would do for the footings, apparently not wishing to remember that place-bricks are as much out of place in foundations as anywhere else, if not more so. So, with all materials used in bulk, be careful to see they are up to specification, for more is to be gained by absence of quality there than anywhere.

The quality of materials used is one of the stumbling blocks in superintending work. To specify the best is one thing, to see you get them is another. Inferior stone, brick and timber, bad joinery and plumbing, paint composed of a non-permanent mixture, mortar and cement bad to start with, and, perhaps, rendered worse by weather, cheap foreign glass, with specks and flaws in it, ironmongery below specified prices, all give chances of future trouble. Extras, described as "the builder's aim and the architect's dread," are always on your tracks, and will total up in an alarming way if not firmly suppressed. It seems a wise precaution not to incur any additional cost without a client's consent unless clearly covered by a stated provisional item. Omissions, too, must be carefully noted, in spite of a builder's human nature to consider them fair plunder. Always warn a client when any variation, suggested by him, is likely to cause extra expense, and never incur the most trifling additional cost without knowing and settling the amount in writing. It is so easy to give a verbal order! But it is a trap for the unwary, as a few months hence will prove when your memory and the builder's may not precisely agree.

In arranging the terms of a contract, it would be well if a young architect could have proper legal advice, though this is scarcely ever possible. When the Royal Institute of British Architects succeed in producing a well-drawn builder's contract, for which we have waited several years, the young architect may have something reliable to go upon, but till that happy time arrives he must bestow much time and thought in preparing one which will, as far as possible, protect his client's interests with fairness to the contractor.

Never forget the peculiar and delicate position you occupy towards both parties to the contract. The architect is, at the same time, agent and arbitrator, and must remember that fact from the moment the contract is signed.

In arranging the prices of such articles as require special reference in a specification, it is well to see, personally, the various tradesmen and their goods, select what is required, and clearly understand and state whether the prices quoted are prime cost, net value, or whether list prices, which signify a profit allowance to builders. It is a little difficult to understand exactly why builders should expect a profit on things which sometimes give them no trouble to obtain, but the insidious practice, like tips, has obtained strong foothold. At any rate you can see that your client pays no more profit than you choose to allow, and make your intention perfectly clear to both tradesmen and builders. In spite of your care, many builders will strive to obtain a further

discount from the manufacturers, but that is the latter's affair, easily settled by an appeal to the architect.

Having the interests of a client at heart, it ought not to be difficult for an architect to secure his confidence and trust, but the difficulty is sometimes to retain them when affairs for the moment go not smoothly. Do not hesitate to differ from him, politely and firmly, if the necessity is obvious and essential, bearing in mind you may be held responsible for any mistakes which may result, even from the adoption of a client's own notions. Give suggestions the same courteous consideration you expect for your own, and in all domestic arrangements never fail to consult the ladies—for they can be very bitter, afterwards, on points which they know probably more about than yourself, and surely have a right to discuss if they don't. Never quarrel with a client, or if you unfortunately do, don't round on him like the Duke of Buckingham's surveyor did, out of revenge, as described by Queen Katherine in Shakespeare's Henry VIII. Whatever be your temperament, never show anger or displeasure, and use every endeavour to part good friends, so as to secure a client's lasting esteem for your manners as well as your talents. Architects now stand far better in the public estimation than they used to do, and it should be the constant effort of every young architect to increase that which is more to be prized than title or riches. "Louis XIV. once taking the air in one of his royal gardens, saw Mansard, the architect, walking by. He soon perceived the old man, who took off his hat, as was strict etiquette in the presence of his sovereign; but the monarch lifted up his hand in friendly reprehension, and said, 'Pray keep it on, the evening is damp, and you may take cold.' The courtiers, who were all standing bareheaded around the king, stared at this extraordinary show of courtesy. But Louis XIV. observed, 'Gentlemen, you are amazed, but learn this—I can make a duke or a marquis with my own breath, but God only can make a Mansard!'" Such honour is given to few of us, but we may all try to deserve it.

Giving estimates is a dangerous business, best avoided if possible. It is very difficult by cubing up a set of drawings, and pricing the result, to be sure of accuracy. Many gentlemen like to know, beforehand, what the probable cost will be, and in giving them an approximate estimate, you are not unlikely to be far out of the reckoning. A client who can bear with equanimity the news that the lowest tender has come out much higher than his architect's estimate is a marvel, and on the other hand too high an estimate may prevent the job going out to tender. I have the honour of knowing a gentleman who, by some mental process unknown to me, always forms an estimate of his own, frequently nearer the mark than his architect's.

Always give a client notice of your intention to issue a certificate, in case his money may be temporarily locked up in securities, and he may not wish to realise on a falling market. In issuing certificates, be careful to keep a sufficient balance in hand, and before you give a final certificate make sure your client has really got all he is paying for. Unless a job is a very small one, it generally suits a young architect to receive his commission at the same time as the builder gets his cheque, and many clients like this method, for there is a satisfaction in paying as you go.

The scale of charges issued by the Institute for our guidance is a very useful basis on which to rely, and a copy should be given to a new client before a job is begun. The public are satisfied with its fairness, whatever Lord Coleridge may think.

It is well to submit all contract drawings and the specification to a client for examination, and if a quantity surveyor be employed, let him know that too. Also, in arranging the quantity surveyor's charges, see that the stipulated payment covers the settling of accounts, for though clients as a rule do not object to pay for quantities being taken out, they fail to see why they should pay any more for accounts being made of the various items, oftentimes a tedious affair, and as necessary as the other. Always ascertain who introduces a client, and thank the friend. Keep out of disputes with adjoining owners and the authorities, if you possibly can, and preserve all the arrangements with them in your own hands.

The Lycopods of architecture are numerous, and often bring grist to the mill when it is most sorely needed. Builders are often referred to dilapidated, and light and airy cases, in his opening address. It can do no one harm to be intimately acquainted



with such things, so long as the main object is kept in view. Landscape gardening, designing wall papers, fabrics, carpets, and furniture, are interesting, and these are subjects which young architects especially, should be competent to hie in, apart from any other branches they may desire to pursue.

The combination of artistic instinct and business capacity are necessary for the complete architect; perception of what is beautiful and appropriate, and what is ugly and out of place; an intuitive understanding and appreciation of form, colour, construction, and materials. He must not neglect those more worldly things which entitle him to consideration, as a man of business. He must show he appreciates the value of money, and can be trusted to arrange its disposal to the best advantage, artistically, and practically. He must keep a diary. Reduce orders and instructions to writing. Keep copies of all documents and drawings. Arrange all papers methodically in pigeon holes, boxes, cases, drawers, and slides, easily accessible. Earn a reputation for punctuality in appointments, and avoid a reputation for exceeding estimates, and allowing the accumulation of extras.

A young architect cannot be too well educated, and along with his other studies, he should find time to improve his mind in general literature, and in those subjects and accomplishments which will make him acceptable in society. He should not neglect the study of man, for all his life he will be dealing with men, and woe betide him if he fails to understand them. It is this study of man which enables engineers, solicitors, doctors, and other professional men, to gain their own way without causing unnecessary irritation. Leave nothing to chance, and never let questions of time or distance prevent proper attention to work. Do not be bigoted, or stick to an opinion, when one practical mind points out a mistake. Study your health. Have settled habits. Be at your office regularly. Dress neatly, and well. Do not spend too much time at your club, if you belong to one, for the mid-day lunch is apt to expand into a two hours' lounge, that when you return to your office the boy may say, "Mr. So-and-so called, and waited half-an-hour, but cannot call again."

The young architect has uphill work, but his future is mostly in his own hands, and difficulties will melt away if met with determination. So, in the words of an ancient, but unknown, poet—

If at first you do not succeed,  
Try, try, try again;  
Time will bring you a great reward,  
Try, try, try again.

The President said that they had with them that evening Mr. Hutton, the Chairman of the London County Council, and he (the President) was sure they would all be pleased to hear anything he might have to say on the subject.

Mr. Hutton said that there appeared to have been in the consideration of the paper no matter too large or too small for Mr. Collard to submit to their attention. It was essential, as the lecturer had pointed out, that there should be love of work, and that they should all realise their responsibility. The responsibility of the architect was a very great one. Within the County of London there were some 9,000 new houses erected annually, and it was part of the duty of the architect, in his (Mr. Hutton's) estimation to restrict the wave of tasteless buildings. He knew that he should be met by the observation that the client wanted as much for his money as he could get, and there was no doubt that that feeling actuated a large number of clients, but he ventured to think that at the present time the average public were dissatisfied with the domestic architecture of the age. He thought that to some extent it was attributable to the fact that a very large result was often required by clients for a very small cost. A client was in great number of cases hopeless to help himself, and then it was that he desired the assistance of the architect. If clients had faults of their own there was no doubt that a large number of architects had faults as well. In his judgment as a layman he considered that the architectural profession suffered greatly from being an open profession. He might be wrong, and if so they could correct him. There was no obligation for particular course of study, and therefore their profession might be called an open one. He thought that was a grave disadvantage, because he regarded, as he had said, the responsibility attaching to architects as very great. Architects are frequently engaged in matters involving quite as great responsibilities as those of physicians or barristers. Their work was

enduring, and they had the power either to elevate or to debase the coming generation. Most of their work, of considerable dimensions, would last considerably longer than most of those in that room would live, and, therefore, he said that the architect had in his hand and under his control that which would make or mar the future of his country. It had been well said that truth must be evident in their work. He understood that it had often been advocated that cast-iron might be introduced instead of hammered or wrought-iron. Well, that was a consideration which involved cost, he was aware, but Ruskin, in his "Seven Lamps," was absolutely true when he directed men, if their financial capacity would not allow them to indulge in costly material, not to indulge in that of a lower order. He (Mr. Hutton) thought that was good advice. He felt that the lecture might be a source of encouragement to the young architect, and hoped that in the coming years the reflection of that night, and the sight of the great work before them, would actuate their motives, and would make itself shown in their future work.

Mr. Basil Champneys said, that after many years' experience in architecture, it always seemed to him that one was always learning. It was surprising to him that young architects got anything to do at all: he was often surprised that any one had ever trusted him (Mr. Champneys) with his first work. On the other hand, it seemed to him quite as remarkable that anyone should employ workers above a certain age. They knew that architecture was a work of invention. It was rare to find that poets produced any of their better works after the age of thirty, and very few after fifty. Of course architecture was a little different in some respects because it was so much a matter of experience. The whole process was mainly experience in learning to know how a thing on paper would look in a building. That was the gist of architecture altogether. The appearance of a building when it was up was to the uninitiated quite different from what it looked on paper. Such experience would only come with years. He thought that it was a great pity that at the present day people had in this and other vocations to spend the best and most enjoyable years of their lives waiting for an opening to arrive. He wished it could be different, and that there could be some organisation of the profession which would enable young men to come to the front and have a better chance earlier. Unfortunately, their profession was imperfectly organised, and he thought it would be some time before individuals would be prepared to make themselves subservient to its general interests. He thought it would help the profession greatly if it were an understood thing that general competitions should be limited to younger men, as numbers of young men could show at once what was in them, and men who had made their reputation might well stand aside. Another point would be gained if those who had the offer of a very large amount of work should see the way to limit it somewhat. They might raise their fees, and try 25 per cent. instead of 5, and so give an opportunity to those who did not ask so much. He fancied that the usual system of economy would weigh, and that they might by those means get as much as they wanted without taking up the work which might legitimately go to others. With regard to punctuality at the office, of course an architect could not be expected to be at his place of business and looking after buildings. That was a point which was easily understood by clients. He thought it was important that the young architect should study economy and businesslike habits, and no doubt these would help towards ultimate success; but as the art of design should be the primary aim of the architect, so he believed that it would prove to be far the most important and permanent factor in his ultimate success. With regard to the question of the architect's attitude towards his client, he certainly thought that in all practical matters it ought to be his aim to take his client's measure most completely. An architect should study the wishes and comfort of his client, but in matters of art it was different, and he thought the architect ought to know best what the conditions of art demanded. Having given way on practical points the architect would find the client paying due deference to his opinion on the other matters.

Mr. Aston Webb said he hoped that Mr. Hutton, when he referred so much to his house architecture, did not mean to saddle the whole of it upon architects. He (Mr. Webb) should think that about the amount of their commission, viz., 5 per cent., would cover the whole amount

for which architects were responsible. It was almost entirely carried out by speculative builders without any architect's control or advice whatever. Mr. Collard mentioned—and he (Mr. Webb) was glad he did—the portraits round that room. He thought that if the Institute had done nothing else, that they would be still entitled to the thanks of the profession for the collection of portraits which they were gradually acquiring, though it was a misfortune they were so badly hung that they could not see them. One of the points that Mr. Collard made was the difficulties that young architects had in making estimates. He had not the least doubt that that was a great difficulty to many young men, who naturally had the fear of making estimates too high. That was a mistake. They should form an estimate to the best of their power, and then call in a surveyor to check it, and thus they could by the aid of a cube form a fair estimate as to the probable cost of work. His own practice was not to rely upon his own estimate entirely, and when he was asked for one he sent the drawings up to the surveyor to prepare it. He thought an estimate was more the work of the surveyor than the architect. Mr. Collard did not mention very much the difficulties of design. It was one of the greatest difficulties that a man had, and one of the greatest pleasures; but it was a thing each man must work out for himself, no advice being of much use upon it. With regard to the difficulty of overlooking work, one great thing was to treat the men in a proper manner. They should remember that a workman might be a gentleman in feeling as much as themselves, and they should also remember that in the way they treated the workmen the workmen would treat them. Another difficulty that young architects had when they first started in practice were certain temptations, which might be put in their way by various people. There was no good evading the fact that the young man starting might have opportunities put in his way which he was doubtful at the time whether he should accept or not. Apart from one's own feeling if they said to themselves "Well, now, would you mind my client knowing this?" that would generally set them right. So also, in the same way in their conduct to their professional brethren; naturally the desire of any man was to get work, and it was difficult for men always to know within what lines they ought to be bound. But that difficulty would be settled if they asked themselves the question, "Should I mind my professional brethren knowing what I have done?" If they thought they would they had better give it up. The great thing was to meet and tackle difficulties as they arise, whatever they were. Browning's description of the man who never turned his back, but stood breast forward, should be one which they should all strive at.

Mr. Thomas Blashill, in proposing a vote of thanks to Mr. Collard for his paper, said he hoped that every architect who came into the profession came because he had a love of the work. It was not an easy profession, but in a sense it was a pleasurable one, although only so to those who had a love for the work. Ever since he (Mr. Blashill) had got to know anything at all about it, the trades and the whole routine, he must say he had never felt tired of it. He had always thought that the operations of workmen were interesting, and the operations of the architect in designing and arranging business matters had always seemed to him to be as interesting an occupation as one could be engaged in. He was quite sure that it was the shortest road to success to have a real and genuine love for what one was about—as then they did not get tired or easily discouraged. Really it was a most serious thing, not only to young men but to all of them, to know how all the large numbers of men who were coming into the profession were to get a living. The idea he should like to impress on their minds was that they could not learn everything at once. A dead level of middling knowledge of everything was the most hopeless condition for a young man to get into. Another point that he believed that most people found that the greatest success in life was to make plenty of friends.

Mr. Atkin Berry, in seconding the vote of thanks, said he was not clear how Mr. Collard meant to put the advice about making a living in the profession. It seemed to him to be open to two interpretations. "Do not let that be your governing motive" was one interpretation, but it also struck him that it might be interpreted as meaning "If you expect to make a living do not come into the profession." In his (Mr. Berry's) opinion it was a profession which to persons of industry, and a average talent gave



opportunities which few other professions offered. Mr. Collard told them that the public very soon discerned the difference between a properly-qualified architect and a West-end sweep. He was not so sure about that. He believed that their profession was one which the general public were entirely ignorant of. He thought that one of the greatest difficulties a young architect had to deal with was his youth.

Mr. Henderson having made a few remarks, Mr. S. Beale said that Mr. Collard had given them a vast amount of detail and information to treasure up in their minds. Mr. Collard had told them how to obtain work. They might take it for granted that the Association was formed to tell them how to carry out work when they got it. He wished to know how far Mr. Collard's suggestions as to the means of obtaining work were legitimate. He did not agree with what Mr. Collard said as to public appointments, but he must say that from all the evidence that was at his command he considered that there were several advantages attaching to them.

The President having put the vote of thanks to the meeting, which was carried by acclamation, Mr. Collard, in reply, said that as regarded Mr. Berry's inquiry as to what he meant by saying that a man ought not to become an architect to earn a living, he wished to convey that a man should not become an architect solely for the purpose of earning a living. As to the methods of getting into a good office, if a man wished to do so, and set his wits to work, he would not have any difficulty. Although he was disposed to think with Mr. Hutton with regard to speculative work in London, he did not think that he (Mr. Hutton) wished to cast any slur upon architects generally. His impression was that Mr. Hutton's remarks were cast at speculative work generally, and not at architects. Some of the work he knew could be attributed to architects, but on the whole it was the speculative builders who were to blame. With regard to public appointments, of course it was very far from his intention to cast any reflection upon men working in them. His point was that if a young fellow really wished to qualify himself as an architect, and to gain that experience which an architect required, and which it was absolutely necessary he should have, he would not gain it in a public office so well as he would outside.

The meeting then terminated.

#### SANITARY INSPECTORS' ASSOCIATION.

ON Saturday last, Sir Benj. Ward Richardson, President of the Sanitary Inspectors' Association, delivered his New Year's address to the members, at Carpenters' Hall. The Association, he said, was to be warmly congratulated on the success of its operations during the past year. The meeting in Glasgow, where he had passed his student days, had been of the most gratifying nature, and his only regret was that he had been unable to take part in the proceedings. No very striking discovery had been made during the year just past, but there had been a decline of the bacteriological craze, and the world at large was becoming more familiar with the leading truths of sanitary science. Two important events had occurred during the year which emphasised the fact, which had long ago been suggested, that cases of enteric fever must never be confounded with epidemics of an infectious or contagious kind, such as typhoid and scarlet fever. An outbreak of enteric fever at Worthing and another in the valley of the Tees, which had proved very fatal, had been traced, with absolute certainty, to a befouled water supply, the connexion of cause and effect having been illustrated in both cases with unusual distinctness. In the first case Dr. Snow, and in the second Dr. Thorne Thorne, had drawn up reports, which would be found of the highest value. He regarded as a great event, signalling 1893, the movement in favour of a crusade against disease which had been initiated among the clergy of the Church of England in the organisation of a sanitary society. The Church of England Sanitary Association had been established with the following express object: "To aid in securing for the poor improved dwellings, healthy surroundings, and increased facilities for recreation; for the well-to-do, the advantages of good sanitation in their houses; and for all, fresh air, pure water, abundant light, unadulterated food, and the greatest possible immunity from infectious diseases." To a crusade having such an object they as sanitarians must all wish "God speed." A measure now under consideration in Parliament was also for sanitarians a hopeful fact.

The Parish Councils Bill was now safe, he thought, though it would doubtless undergo some alterations in the House of Lords. When the Bill passed, he thought the members of the Association should meet in conference to consider what its effect would be upon sanitation. He believed it would revolutionise the ideas of the community and be the means of advancing the science of sanitation to a greater extent than had hitherto taken place. He hoped it would lead to the establishment of a Public Health Department with a responsible Minister at its head, and he hoped that such a minister, whenever appointed, would be a permanent Minister of Health, invested with extensive powers, enjoying high rank, possessing the highest possible competence for the office, and as irremovable as a Judge of the High Court. When this Bill became the law of the land it would make every parish a centre of sanitary knowledge. It could not fail to lead in the future to the appointment of parish sanitary inspectors, with minor duties, who would be practically a body of assistant sanitary inspectors.

A vote of thanks was accorded on the proposal of Mr. Griggs, seconded by Mr. Young, who expressed regret that no mention had been made by the President of a terrible disease, diphtheria, which had been extremely prevalent during the past year or two.

In acknowledging the vote of thanks, the President said he had had a great and sad experience of diphtheria, which he had followed from the earliest cases that had been notified at Ash, in Kent. The disease was then an unknown one, but it had now become one of the greatest of all diseases. He regretted to say that we now seemed no nearer finding out the causes of the disease than we were then. One thing they knew; it was always favoured by impure air, but there were many cases of an opposite kind where ten or twelve persons, amid the most salubrious surroundings, had been attacked in the best houses. They had no sound basis of statistics to go upon as in typhoid and cholera attacks.

### Correspondence.

To the Editor of THE BUILDER.

#### THE CHRISTCHURCH OF DUBLIN.

SIR,—A paragraph in last week's *Builder* may be worth a correction.\* *Sigtryg Silkebaard*, King of the Danes of Dublin (not *Edric*, as the printer would have it) founded the Christchurch of the Holy Trinity at Dublin, anno 1038. Observe that "Cathedral of Christ Church, Dublin," as you print it, is tautology. "Christchurch" as we have it is a *Cathedral*. It is one of those few words of Scandinavian speech which have survived in Ireland—i.e., Head Church. The fact of the survival of any part of a Danish-built Christian church in any part of the kingdom is so unique that I think it is worthy of more notice. Christchurch, Dublin, an Anglo-Norman church of symmetrical cast and design, stands on the substructure of a queer rude old crypt. There can be no mistake about its being much older than the Anglo-Norman work 1190-1235 raised on it. The nave piers of 1230 do not stand truly over the piers below.

A curious *calamita* of evidence lately established the authenticity of the Danish work. Strange as it may seem, it started with Charles Kingsley. In his "Hereward the Wake" he intimates the sound historical basis on which he constructed a romance. To his friend Thomas Wright, Esq., F.S.A., &c., &c., he says in his preface as to Hereward:—

"You taught me how to furnish his rusty harness, botch his bursten saddle, and send him forth once more on the ghost of his gallant mare."

Early in his book Kingsley quotes from his friend's authority as to *Sigtryg* and his cousin, Harold of Waterford—

"He (Harold) had been many a time into Dublin to visit his even more prosperous and formidable friend, and was so delighted with the new church of the Holy Trinity which *Sigtryg* and his Bishop Donatus had just built . . . that he determined to build a like church in honour of the Holy Trinity in Waterford itself."

The Danish Christchurch of Waterford, with its Anglo-Norman additions, existed until 1770. I was then barbarously effaced to raise a less interesting Classic building on the foundations of its outer walls. Ware's history, however, preserved

a very good plan of the destroyed church. Recent works which I was concerned in disclosed the Danish and Anglo-Norman piers, still standing 8 ft. high, under the modern floor. Ware's plan was absolutely "checked" and confirmed. As a matter of interesting record I laid down a correct plan of ancient Waterford Christchurch to an 1/4th in. scale, and discriminated the Danish from the Anglo-Norman part.

It was mere accident that I placed a tracing of it over a similarly scaled plan of the Christchurch Dublin crypt. There could be no mistaking that, pier for pier, dimension for dimension, the Waterford Christchurch had been genuinely a replica of the Dublin one, as Kingsley had quoted it from Wright. It could be no mere coincidence or accident. With this key the mystery of Dublin Christchurch was plainly manifest. The crumbling rude remains of the Danish Church were easily discriminated from the Anglo-Norman interpolations, and the purpose of them clearly demonstrated.

It is perhaps worth while to correct a casually-clipped paragraph to point to this unique survival: of plan of a Danish Cathedral founded by Christianised Danes in 1038.

So far as the nave and transepts go, the identification of the similar plan of the Danes' plans of Waterford and Dublin are sure enough. What the Waterford Church had eastward of that before the Anglo-Normans built a choir there, no man can now say; but it is my belief that the whole crypt plan at Dublin is that of the Church of the Sietryg, remaining complete. The curious quasi-apsidal arrangement at the East end, the attached Lady Chapel to the N.E., so resembling the contemporary Scandinavian Church of Thronhjelm. The known inter-communication between the Danish communities of Dublin and Northern Scandinavia point to this conclusion. A square eastern chapel, to which the apsidal inclination tends, seems to be the *feretrium*, which the relic-mongering reverencing Norseman or Christian persuasion took to. Thronhjelm's Christchurch has its *feretrium* and list of relics. Christchurch of Dublin has record of its amazing relics also. The Danes are a fashion just now. A circular to-day has informed me of the foundation of a "Viking Club" at the King's Weigh-house, Grosvenor-square, with striking titles for its members and officers. For real high ceremonial, I look forward to this interesting society resorting to the ancient and exclusive Danish city of Dublin and to the precincts of the only preserved *Christchurch* of their northern forefathers.—Yours, &c.,

THOMAS DREW, F.R.I.B.A.

Christchurch, Dublin, January 8, 1894.

#### "LONDON STREETS AND BUILDINGS" BILL.

SIR,—In most of the suburban districts of London new roads may be found with houses built and inhabited to some extent, the roadways of which in wet weather are complete quagmires; in dry weather are full of ruts; and in windy weather present clouds of dust, no attempt whatever being made to but keep them in order. Now that the London County Council are going to Parliament for further powers over roads, it seems a good opportunity to include this subject in their Bill. I would suggest that the local authorities should have power to require persons who have laid out or may hereafter lay out new roads to make up such roads and keep them in repair, and water, light, and cleanse them to the satisfaction of the authorities until the roads are taken over as parish roads.

A LONDONER.

#### STAINED GLASS AND DESIGNING.

SIR,—In your last issue you describe a painful and extraordinary partitioning of a work of art, refer to the production of the staircase window executed for a house at Rivington, for Mr. A. Pilkington.

From your columns it appears that the "general" idea of the design emanated from Mr. Pilkington himself, who evolved the plan of placing three allegorical figures in a row, an "idea" so very "general" that one can hardly think of it without a yawn.

On this conception sketches were made, not, a might naturally be supposed, by these commissioners to execute the work, but by draughtsmen—"ghosts" in their employ. The sketches thus circuitously obtained, were then surrendered to the "criticisms" and corrections of Mr. Pilkington and his architect. After this, the sketches were "developed" into the full-size cartoons, which, after a like process of revision and corrections, were put into glass.

This art-killing method of patrolling the art (glass-painting)—which art could survive—show how those employed on the decoration were unequal

\* We beg to say that we are not responsible for the mistakes alluded to by Mr. Drew.—Ed.



and personally without share in, the authorship of the work they undertook to produce, and that the sign, brought forth under such system—was—*scribble dictu!*—sent ultimately to the Royal Academy exhibition in the name of the architect! Comment is needless.

January 3, 1894.  
\* \* We simply gave the facts as communicated us by the architect. We left it to our readers to make any comment.—ED.

# MIDLAND TRUANT SCHOOLS.

SIR,—In the particulars given of the above school the current issue of the *Builder*, you state that a design carried out was placed first in open competition.

In common justice to myself I trust you will insert correction of this statement, as the plans marked "Supervision" were placed first by the assessor (Mr. E. R. Robson), and were set aside by the committee in favour of the plans carried out.

RICHARD J. ROWE.

\* \* The mistake was not our fault.—ED.

# ANCIENT OVENS AT WESTMINSTER.

SIR,—I note in your very interesting and refreshing essay upon Westminster Abbey, which commences the New Year's number of the *Builder*, reference made to the old ovens laid open for a short time at the south-west angle of Ashburnham House. I had the privilege of studying this house at the time (1882), and recorded one (the only one I saw) upon a measured ground plan I then made, and which was published in the *Builder*, March 14, 1885. As this plan was one of a set of student drawings, and I had heard no other opinion, I queried the oven, but I had no doubt that it was an oven, and I now think it must have been one of those you refer to.

I recorded also upon the plan certain ancient walls then observed, as well as the plan of the porch or ledge in front of the forecourt, subsequently pulled down to make way for the new railings and pier—such at the time, I recollect, I thought rather a pity.

The essay on the Abbey refers to Ashburnham House as Inigo Jones's. Possibly you do not concur in the view that it is the work of his pupil, J. Webb. In the article on Webb in the "Dictionary of Architecture," I believe it is stated that Webb merely superintended the carrying out of Inigo Jones's designs for the house. But Mr. Papworth, in his "Italian and Renaissance in Great Britain," published in 1883, states that Ashburnham House "is now considered to be by J. Webb." It would be interesting to know the precise grounds for this conclusion, and whether subsequent evidence led to the statement in the volume of the "Dictionary of Architecture," which I fancy was issued after Mr. Papworth published his work.

HARRY SIR.

# BAD BRICKWORK.

SIR,—I beg to enclose you full-sized rough drawings of brickwork now being done with bricks selected by a "committee." The bricklayers ask what they are to do to make proper work? Perhaps Mr. Fleming will answer. Until a proper standard size is insisted on, slipshod work must go on; the skilled workman cannot satisfy himself or his employer, and is in no wise to blame. WILLIAM.

\* \* The bricks appear to have varied in standard size to an extent which must have made it impossible to produce good work with them.—ED.

# PRIME COST.

SIR,—The subject of prime cost was, I supposed, settled in most minds, but "G. W. L.'s" note in your last issue appears to indicate the contrary.

The trades which supply builders have gradually adopted customs different to those existing in any other business. The ordinary system of trade is a monthly account comprising all the transactions up to a certain date of such month; and if paid before a fixed early date in the next month, there is allowed on such payment 2½ per cent. discount for cash. This also is the practice of the trades with which builders deal, but in addition to this discount there is allowed another so-called discount varying from 5 to 60 per cent. The builder has a strong motive to conceal this latter discount from the man who may be dealing with the building accounts; and some firms which supply builders will even descend to the meanness of giving two invoices, one to be produced to the surveyor or architect, in which no trade discount appears, and another for the builder's private use, in which it is allowed. This possibility is provided for in some conditions of contract by a clause which stipulates that not only the invoices, but the receipted monthly statements shall be furnished to the person adjusting the building accounts.

Concealment and subterfuge cannot be justified, but some excuse may be found for the builder, in the practice of some surveyors who appear to forget that the builder does not work for mere amusement,

but for a living, and grind every price down to its very lowest possibility.

This is either from ignorance or the desire to carry out the instructions of an architect who has exceeded, from incompetence, heedlessness, or other causes, the amount he was empowered to spend. Such a course is not unfrequently strengthened by a clause in the conditions of contract, making the architect's decision final on all questions. An architect incompetent, or unprincipled, or both, adopts the clause, the unwary builder signs it, as a part of his contract, the architect instructs his surveyor to keep the amount down. This is done: the builder, naturally indignant, appeals to the architect, who shelters himself under the condition, and the nefarious conspiracy is successful.

Another reason for the reticence of the builder about trade discounts is the uncertainty of their destination; not unfrequently the architect takes them. One is familiar with the virtuous indignation of the profession at such an assertion, and with the challenge to produce names for the Royal Institute to deal with. Those who know most are blessed with preternatural wariness and do not respond.

What are the causes which have combined to produce the present condition? They are various.

The large number of trades whose work enters into a modern structure, puts the builder into the position of a mere agent for its supply, and the arrangements which worked smoothly only a few years ago are now inconvenient; the example of the stoves for a building, for which a sum is generally provided, may illustrate this.

The architect accompanies the builder to a stove merchant and selects a certain number of stoves; the prices named by the salesman are list prices; and besides the ordinary discount for cash these are also subject to a trade discount of 20 or 25 per cent. It depends greatly upon the view the architect may take of legitimate profit whether this trade discount shall be interfered with or not. If there is a stipulation in the specification that the sum provided is "prime cost," and that prime cost means net cost after deduction of trade discount, but not of ordinary discount for cash, it would appear that the adjustment is easily effected, especially if the specification provides that if the builder requires a profit on provisional sums he shall add it to the amount named, when reference to the original estimate will readily show how the sum in question has been treated. When, as is frequently the case, there is no such definition in the specification, it seems reasonable that the net cost at the warehouse and the cost of packing, carriage, and fixing should be ascertained and a reasonable profit added to the total. Some specifications settle what the profit shall be on provisional sums.

The justification of a condition of thing which has no parallel except in the building trade and in the sale of some exceptional things (pianos, sewing machines, bicycles, machinery, and such like), is to be found in the fact that some of the articles bear a much larger discount than others. There is, moreover, among some manufacturers a keen competition for builders' custom, and a larger trade discount is a means used to attract business.

Printed and illustrated trade lists, with prices attached, are another uncommon feature peculiar to this group of trades.

Let us take, for instance, the trade-list of a great manufacturer of gas-fittings, often well illustrated, and with printed prices which bear a discount of 20 or 25 per cent. These lists are used by builders and retail ironmongers alike to show to their customers, and in the case of the ironmonger the printed prices represent those he would obtain from the purchaser.

Pattern-books of paper are used in a similar manner by builders, retail dealers in paper-hangings, and small decorators, and sometimes involve a trade discount of as much as 40 per cent., but the marked price is that charged to the ordinary buyer.

Some of the larger firms refuse to supply any person who is not in the trade, and in such a case an architect or building owner can only select goods on the builder's order, and such goods are quoted at list prices; but these firms are exceptions.

It will thus be seen that the system has convenience to justify it, but that there is good reason for what may at first sight seem inquisitorial interference with the builder's private affairs.

The majority of surveyors of experience know the trade discount offered by every firm in the kingdom of any note, and they are sufficiently aware of the difficulties which beset the builder's business to allow a reasonable profit on the net cost unless it has been excluded by the builder's deliberate act in his original estimate, which is frequently the case.

The necessity of dealing in this manner with such items as are in question is further justified by the fact that some firms give no trade discount at all. Those who, after giving a trade discount, have attempted to revert to the ordinary trade usage of giving none, have met with disaster; but firms who give no trade discount are more plentiful than they were.

The tradesystem appears to be so firmly established

\* \* That we wish they would. But this cannot be the case with any of the people whom we should call, in the true sense of the word, architects. The practice of making a general charge of this kind, without authenticating any special case, does no good whatever, and is not in very good taste.—ED.

that it is not likely to be altered, but it presents no difficulty to the man who knows his business, and draws his conditions and contract accordingly. Nor does it work badly when in the hands of honourable men. The chief objections to it are the opportunities which the system presents to the cunning man, for various shifts and deceptions; but those business transactions are few which do not offer such opportunities.

The insistence by the builder upon a further discount from the manufacturer who has already allowed it to the building owner or his architect is common enough; indeed, the habit with some contractors is so confirmed that they will even attempt it with the quantity surveyor. The only remedy for this is a certificate direct on the building owner, and some architects pay every provisional sum by such direct certificate.

Much of the trouble incident to the settlement of questions of trade discount may be avoided by specifying articles by the numbers in the trade lists, with the list price, by clearly defining the rate of profit on any article not so specified, and the meaning of prime cost commonly thus:—"The letters P. C., or the words prime cost in this specification shall mean the price at the manufactory after deducting the trade discount, but not the ordinary discount for cash."

In the clause given as an example by your correspondent, the meaning of the word "works" is (I think) ambiguous. It may mean either the works of the manufacturer or the works of the building to be erected. If the former, the word "manufactory" is better.

JOHN LEANING.

28, John-street, Bedford-row.

# The Student's Column.

## THE STRUCTURE AND PHYSICAL PROPERTIES OF BUILDING STONES.—II.

THE term "physical properties," requires a little explanation. Every mineral substance in Nature possesses certain properties relating to hardness, density, porosity, &c., the precise nature of which can only be ascertained by direct experiment. The mineralogist uses some of the results thus obtained to assist him in the classification or determination of mineral species, and for many other philosophical purposes. The geologist and petrologist, dealing particularly with density, studies that property in mineral aggregates, to assist in explaining the origin, and in the classification of rocks. And it may be taken for granted that the causes that have stimulated enquiry into the physical properties of mineral substances generally, when actuated by the devotees of pure science (as distinct from applied science) have always had their origin in the necessities of pure science. It is perfectly possible, therefore, for a scientist to be very learned in the bearings of certain physical aspects of minerals and rocks, and yet to be quite unaware of their value, or practical application.

There is no end to the physical properties of a rock; all, so far as they are known, may be demonstrated by experiment or described; new ones may be discovered by any experimenter conducting inquiry along novel lines; we hope to bring out a few during our present investigations. We would not have the student imagine, however, that we shall explain all the hitherto recognised physical properties of rocks, or even a tithe of them. All we can do is to describe certain of those appertaining to rocks used for building, and which have some interest to the architect. Amongst these, special attention will be drawn to the following:—

- a.—Hardness, toughness, brittleness.
- b.—Absorptive powers, capillarity.
- c.—Penetration of air.
- d.—Specific gravity.
- e.—Behaviour under varying temperatures.
- f.—Strength, compressive and tensile.
- g.—Elasticity.
- h.—Resistance to abrasive action.

A species of relationship exists between some of these properties, but it is at present very imperfectly understood. If all the results obtained under the various headings had been arrived at by uniform methods, they would be more strictly comparable. We know, however, that hardly any two large series of tests have been worked out in precisely the same manner; and it is on this account that many results on the same material are apparently so divergent.

In dealing with each of the physical properties mentioned, we shall first explain the meaning of the term and define its scope; secondly, the methods of experimenting (if results are to be arrived at by such methods); and thirdly, its practical uses in the present inquiry, and to the architect. The actual results on each stone



examined will not be given in connexion with these preliminary observations, which are merely designed to acquaint the student with the nature and extent of the physical aspects of the work, and to endeavour to lay down an uniform method of procedure.

**Hardness.**—When we speak of the hardness of a building stone, we have in mind not only the hardness of its mineral aggregates, but their combined effect. Minerals have been divided into ten degrees of hardness, as typified by the following:—1. Talc. 2. Rock-salt. 3. Calc-spar. 4. Fluor-spar. 5. Apatite. 6. Felspar. 7. Quartz. 8. Topaz. 9. Sapphire. 10. Diamond. Thus if a building stone contained a fair proportion of both 3 and 7 (which it often does) its mineral hardness would, in general terms, be said to be "variable," as distinguished from "uniform." But the hardness of the stone from the mason's point of view depends in a great measure also on the manner in which 3 and 7 are disposed with reference to each other, and on their state of aggregation. If they bind themselves together compactly, the stone would be hard; if not, it might be soft—this with the same mineral constituents. We were about to put down a "scale of hardness" for building stones—it would be very useful—but on second thoughts hesitate lest our object should be misunderstood. We have made one, however, for our own guidance, and find that it corresponds pretty closely with the relative cost of tooling divers of the best-known stones, commencing with a soft jerry-builders' material, and ending with a hard granitic rock. It must not be forgotten that the hardness of a stone varies very considerably after it is quarried. Many stones, when first raised, are so soft that they can be carved or cut with a knife, by reason of their containing so much moisture, or "quarry-water," as it is termed. As this moisture dries out, the stone becomes harder, and may then be said to be in its normal condition for building purposes. It should never be hardened, however, by artificial heating.

The method of ascertaining the hardness of a mineral is easy enough. If, for example, it will scratch felspar, and will not scratch quartz it will have a hardness of between 6 and 7, which would be placed at 6.25, 6.50, or 6.75, according as it approached the felspar or the quartz. To arrive at the hardness of a building stone is also an easy matter, but it is difficult to state it in figures in the absence of standards of comparison. At the present time there is probably no more practical method (rough as it is) than by obtaining the relative cost of working divers stones which, as before remarked, is a fair index of hardness. It is highly probable, however, that more satisfactory results would be arrived at by experimenting with the materials in a planing machine or lathe. In practice there would nearly always be an uncertain element, unless great care were taken—viz., the time elapsed since the material was quarried and the date of the experiment, which, as might be surmised from foregoing observations, is a most important factor. Or, to put it in another way, one would never know how much the quarry water had dried out, and how much of the hardness, therefore, was artificially produced.

The value of the property of hardness is too manifest to need very much comment. Apart from commercial considerations, with which we have nothing to do here, it may be pointed out that where a stone is composed of mineral fragments of varying degrees of hardness it is almost sure to suffer in tooling, and to develop a "starred" surface. Where it has a considerable amount of mineral matter of a hardness of 3, in which pieces of the hardness of 7 are not too plentifully scattered about, it generally behaves very badly under the planer. Suppose a block of crystalline marble (calcite—hardness about 3.5) containing streaks of quartz (hardness 7) is placed on the polishing table, it will be found that the calcite forming the base of the stone will receive the polish long before the quartz streaks or veins, whilst these latter also have a tendency to stand out from the surface of the material. Again, let us place a block of common oolitic limestone (earthy calcite—hardness about 2.65) containing occasional small spots, or concretions, of crystalline calcite (3.5), or quartz (7) under the planing machine; if a fine moulding is in progress we need not wonder that a transverse crack is sometimes developed, owing to the jarring action of the machine against the harder minerals in its endeavour to overcome them. Granite, as the student knows, is made up of three minerals—quartz, felspar, and mica; and each of these is

of different hardness. The quartz, as before stated, is 7, felspar 6, and mica about 2.75; anyone who attentively regards the surface of polished granite will be enabled to detect these minerals by the different quality of polish each has taken; the mica, indeed, is rarely polished at all—merely smoothed down. Thus is the uneven polish of granite to be accounted for.

The possession of minerals of widely differing degrees of hardness is a great asset to a building stone from the point of view of its expanding and contracting properties; this will be fully dealt with in that section relating to the behaviour of stone under varying temperatures.

#### OBITUARY.

**BARON VON HASENAUER.**—We regret to announce the death of Baron von Hasenauer, the last of that distinguished body of Vienna architects who did so much for the beautification of their city. He was the youngest of that wonderful corps that was headed by Hansen, Ferstel, and Von Schmidt, and he has unfortunately succumbed to his mortal disease before the last building of the imposing series of works which was intrusted to that body has seen its completion. The new "Hofburg" or Royal Palace which has been in course of erection for some years under Professor Hasenauer's able guidance is the last of the series, but its completion is not due until 1900. The learned Professor who died at the age of sixty had always hoped to be spared to see the inauguration of this last important Vienna monument. His last one was the new "Hofburg" Theatre, and prior to that the two Royal Museums, both of which he designed jointly with the late Gottfried Semper. The buildings of the Vienna Exhibition of 1873 were the last of his provisional erections. Baron von Hasenauer, a Viennese by birth, received his first technical education at Brunswick, and subsequently studied at the Royal Academy of his native town. He then visited Upper Italy, France, Holland, and the British Isles. In 1864 he was successful in carrying off the first prize for architectural design at his school, and later earned a like distinction at the Viennese Exhibition of 1864. He was placed second in the competition for the façade of the Cathedral at Florence, and third in that for the design of the new Vienna Opera House. The Viennese Academy elected him a member in 1866; the Royal Institute of British Architects made him an honorary corresponding member in 1867; and the Berlin Royal Academy followed suit in 1868, when the holder of these many honours had only reached his thirty-third year. At the time of his death he was the President of the Royal Academy at Vienna, as well as an "Oberbaurath," or Senior Crown Surveyor. Personally Freiherr von Hasenauer was one of the most popular architects on the Continent, and a well-known figure in the many competition juries of his time and professional congresses. He always had time for the younger members of the profession, no matter what their purpose or their country may have been, and any intercourse with the kindly figure will always be remembered by those who came in contact with him. We shall treat of his many important works more fully at an early occasion.

#### GENERAL BUILDING NEWS.

**ALTERATIONS, ROYAL ITALIAN OPERA HOUSE, COVENT GARDEN.**—The Royal Italian Opera House, Covent Garden, has, since the finish of the Promenade Concerts, undergone various alterations under the supervision of Mr. P. E. Pilditch, of the firm of Messrs. Spencer Chadwick & Pilditch, architects, of 17, Parliament-street. Alterations have been made in the basement and gallery, and precaution has been taken to protect the auditorium from fire. The dressing-rooms have been rendered fire-proof by means of concrete floors and ceilings, with iron doors.

**BUILDING TRADE IN EDINBURGH.** At the recent annual dinner of the Edinburgh and Leith Master Builders' Association, says the *Scottish Leader*, the President of the Glasgow Master Masons' Association spoke hopefully of brisk trade and better prices than had been got since the failure of the City of Glasgow Bank, while the President of the Dundee Master Builders' Association spoke in despondent tones of dull trade, keen competition, and working at a loss, through the failure of their staple local industry, the jute trade. The condition of the building trades in Edinburgh and Leith during the past year has stood between these two extremes. The builders have been fairly busy, and all hands were fully employed until recently, when, as is usual at the close of the year, dull trade asserts itself, and idle hands (especially joiners) are to be daily met with.

The McEwan University Hall, St. Cuthbert's Church, North Merchiston U.P. Church, Craighouse Asylum, Chancelot Co-operative Wholesale Mills, and the railway works at Ravelston, Davidson's Mains, and Cramond, may be said to be out of the builders' hands. A considerable amount of work for the building operatives is indicated by the mention of these and other works in progress, such as the distillery and brewery premises at George-road

and Roseburn, the Observatory at Blackford Hill, new board schools at Roseburn and Montpelier, extensive additions to the Deaf and Dumb Institution, Henderson Row, the Church of Scotland Hospital and Mission premises, Pleinence; St. Cuthbert's Church Hall, King's Stables; Caledonian Railway Station; and the Haymarket Tunnel of the North British Railway. During the past year a few villas have been erected, chiefly in the Blackford Hill district, with additions to some of the houses at Murrayfield and Whitehouse Loan. Tenement houses are also being erected at Viewforth, South Mornington, Dalkeith-road, and in the London-road district. During the coming year the following contracts will fall to be carried out viz.:—The new dock works at Leith just begun, Jenner's buildings, Princes-street; additions to the North British Rubber Works; the new E.U. Church, Dalry-road; the two spires on the east towers of St. Cuthbert's Church; and the spire of Mayfield Free Church. The City Improvement and Destroyers are in the not-far-distant future, although they may not give much work for the building trades during 1894.

**NEW HALL, SALCOMBE, DEVONSHIRE.**—A new building was opened at Salcombe on the 27th ult., for use as a snook's Billiard Class and Institute. The building occupies a central position in Market-street, the front being built of dressed limestone, whilst the windows and door frames are of Bath stone. In the assembly hall the lights are of stained glass. The walls have match-board boarding, 3 ft. 6 in. high, and the roof is an open one with boarded ceiling. Medical officers' rooms are attached to the roof. There is an ante-room leading out from the assembly hall, which, when required, can be added to the main hall. The assembly hall and ante-room combined will seat about 250 persons. On the basement floor is a reading-room. On the opposite side of the entrance passage is a recreation-room, which will also be used as a smoking-room. There is also a kitchen on the basement floor. The building has been erected from plans prepared by Mr. John Willis, architect, Derby. The masonry work has been carried out by M. A. Stumbles, and the carpentry and joinery by Messrs. Cranch & Issel, whilst the plumbing and gasfitting has been done by Mr. F. J. True, and the painting and decorating by Messrs. Cook & Chapman.

**COTTAGE HOSPITAL, THAMES DITTON.**—A new cottage hospital has been opened at Thames Ditton, Surrey, containing three rooms for patients, a nurses' bedroom, bath-room, and water-closet, on the upper floor, and an accident ward, day-nurses' medical officers' room, kitchen, scullery, &c., on the ground floor. The building was erected on two additional wards to be built if needed. The cost of the building is about 820l. Mr. A. J. Style, of Victoria-street, Westminster, is the architect, and Mr. W. Callingham, of Thames Ditton, the contractor.

#### SANITARY AND ENGINEERING NEWS.

**DISPOSAL OF MANCHESTER LUGGERS' REFUSE LIQUORS, DARWEN.**—An important Local Government Board Inquiry, affecting the disposal of manufacturers' refuse liquors, was held on the 20th ult., before Mr. Klenz, Walton, M.Inst.C.E., at the Municipal Buildings, Darwen, respecting an application by the Darwen Corporation for sanction to borrow 35,000l. for a sewerage scheme. Mr. E. A. Parry, Barrister, Manchester, appeared for the Corporation, and several paper-mill owners were also represented, with the view of forcing the Corporation to take the paper-makers' refuse liquors, which are estimated at two million gallons daily, into the sewers, the scheme was formulated by the Corporation being designed to purify only the town sewage, which amounts to about one million gallons per twenty-four hours. Mr. Stubbs, the Borough Surveyor, stated that the system decided upon was that known as the Inter-natural; the sewage to be treated with ferrous, in six precipitation tanks, and subsequently filtered through beds of polarite, of which there would be twelve in number. Mr. Frank Candy, Managing Director of the International Company, was called to explain the system of purification to be adopted, and gave it as his opinion that there would be no difficulty in treating the paper-makers' refuse, but confirmed the Borough Engineer's statement that it would be more economical to deal with it separately. Dr. C. A. Burghardt, Ph.D.F.M.S., of Owen College, Manchester, was called on behalf of the Corporation, and stated that in his opinion the paper-makers' refuse would be injurious to the sewers, causing offensive gases to be emitted, unless the refuse were first treated at the paper works to render the liquor neutral, or, preferably, slightly acid. In cross-examination, Dr. Burghardt stated that with suitable previous treatment of this mill refuse, the polarite beds would be capable of purifying the mill refuse and sewage combined. Mr. Sutton, who addressed the Inspector on behalf of the paper manufacturers, contended that the manufacturers' refuse must be admitted into the sewers, and said that this was one of the most important occasions upon which a Local Government Board Inspector had come into Lancashire. Upon the decision of the Local Government Board in this case hung issues which, he ventured to say, were most interesting to the trade of Lancashire; and, whatever the decision, it would have a most



important effect on manufacturers throughout the district. Mr. Parry, on behalf of the Corporation, said that, if Mr. Sutton were right, why did he not get a mandamus at once, and compel the Corporation to take the effluent into their sewers? He asked the Inspector to report to the Local Government Board that there was no one who had given evidence to prove their right to make use of the sewer, if there was a sewer into which paper-makers could turn their effluent. The inquiry, which lasted for nearly seven hours, then terminated.

**MELTON MOWBRAY.**—The Melton Mowbray Local Board have decided to adopt the international system for the purification of their sewage, and have instructed Mr. Edmund Jewes, C.E., Architect and Surveyor, of Melton Mowbray, to prepare plans for the works.

**WATER SUPPLY WORKS, BIDEFORD.**—It was recently announced that the supplemental reservoir constructed by the Bideford Town Council was being filled. Four filter-beds complete the scheme for rendering Bideford water-supply above reproach, and these, says the *Herald and Morning News*, are now ready for use. There is capacity in the two reservoirs for at least 25,000,000 gals., and the storage at present is over 20,000,000 gals. The overflow from the new or upper reservoir is ample for the winter needs of the town, but in addition four or five springs have been captured by the contractors, and are being used for the overflow to the lower reservoir. These in great part may be claimed as extra water. All the work has been executed by Messrs. Perrin & Long, through their representative Mr. I. Flitton, Messrs. H. Tardrew & Son, Bideford, being responsible for the ironwork. The new reservoir has a capacity of 10½ million gals., and is about 40 ft. higher than the old reservoir. A concrete apron for the overflow to the lower reservoir has about 40 steps of varying height. At the foot of the lower reservoir are the filter-beds, each being 30 ft. by 30 ft. The depth of filtering material is 5 ft., and consists of four layers of different kinds of gravel, with 3 ft. of sand on the surface. All the gravel came from Spratridge, Appleford, and the sand from just inside Bideford Bar. There are 600 tons of sand and 200 tons of gravel in the beds, for the walls and floors of which 200 tons of cement and over 300 tons of stone, gravel, &c., were required. The cost of the reservoir has been over 5,000l., and of the filter-beds 1,136l. Mr. Baldwin Latham, C.E., is in charge of the scheme. The resident engineer is Mr. A. J. Jenkins.

**THE SEWAGE QUESTIONS IN COPENHAGEN.**—Two of the questions uppermost in the public mind in Copenhagen at the present moment are the disposal of the fecal matter and the sewage, the latter being distinct from the former, in which respects the Danish capital leaves much to be desired, like nearly all Continental cities, and the leading sanitary and engineering organ, the *Ingénieur* has of late devoted much space to these important subjects. A proposal, supported by several leading sanitary engineers, is the introduction of water-closets on English principles, the annual cost of maintenance of this system for the whole city being estimated at about 12,000l., the daily consumption of water being 40,000 barrels (5·6 million litres) a day at 1s. 4d. per 100 barrels. Each flushing is estimated to consume 16 litres (3·1 gallons) of water. On the other hand, a well-known sanitary engineer, Herr C. Schouboer, maintains that this estimate is far too low, and that if water-closets are to be introduced, water-meters would unquestionably be required in order to arrest waste, and that the cost and maintenance of 8,000 of the same would be no less than 4,450l. a year alone. Moreover, he considers that the installation of a water-closet is far more expensive than that of a poudrette closet. He estimates the cost of each closet at 4l., and the total installation for 30,000 water-closets at about 17,000l. And allowing 10 per cent. of this sum for the annual maintenance and interest on capital, there is an additional expenditure of 11,700l. a year. He estimates the total cost of the introduction and maintenance of the water-closet system in Copenhagen at 27,000l., as against the first estimate of 12,000l. Another proposal is the erection by a private firm of *entrepreneurs* of a fecal factory for turning the latrine into poudrette by a method similar to that of Podewil, recently described in the *Builder*, and which is working so successfully in Augsburg, but as the firm in question demand a subsidy of 30,000l. a year to carry out this scheme, and the cost of the present system is only 14,000l. a year, there is little prospect of this proposal being accepted. The *entrepreneurs* offer to pay the Municipality 1,700l. a year out of this amount, but of course this and the former sum would come out of the taxpayers' pockets, hence the objection to the scheme. On the other hand, the farmers around Copenhagen are most anxious to retain the existing system, whereby they obtain the raw and undiluted latrine for manure at a reasonable price. They maintain that the poudrette manufactured is suggested is not nearly so effective for fertilising purposes. Formerly the price was 25 øre (4d.) per barrel (140 litres), but when the Copenhagen Renovation Company was formed some years ago, the price was raised to 50 øre (6d.) per barrel, and this high price reduced the sale of the latrine to a great extent. Another great drawback to the present

system is also that the latrine must be removed within certain fixed hours in the early morning, an arrangement for which the company has no sufficient material. It is, therefore, proposed that two or three light railways should be built from the city into the neighbouring agricultural centres by which the latrine could be rapidly conveyed out of the city. The rapid conveyance out of the city of the fecal product is one of the chief points under consideration, in view of the recent threatened cholera epidemics. The cars for these railways would be specially constructed for the object in view. Meetings of farmers, &c., have been held around Copenhagen in order to retain the present system with the railways suggested, the most important being one in the island of Amager, where are situated the extensive market-gardens of Copenhagen, at which it was decided to petition the municipality to carry out these suggestions, the farmers undertaking to take all the fecal matter from the city up to the year 1900. Probably the price of the same will be reduced a little. Another equally important question now on the tapis is the disposal of the sewage in Copenhagen. At present, all waste and slop water is carried away through mains from the houses, and emptied into the harbour, a most dangerous arrangement, it is admitted on all sides, from a sanitary point of view. The city engineer, Herr Ambt, now proposes to cut all these mains by a great transverse one close to the harbour, through which the sewage would be carried out into the Sound, on the other side of the island of Amager. It is pointed out that the sewage water, being lighter than sea water, floats on the surface, rendering the state of the harbour most dangerous, particularly with southern winds and tides, whereas in rivers the two kinds of water commingle easily. Herr Zartmann, a well-known sanitary engineer, however, opposes the scheme of the city engineer, unless the manure referred to be carried much further out to sea than proposed. His idea is to commingle thoroughly the sewage and the sea waters by sinking wells at the mouths of the existing sewage mains, and by turbines driven with electricity pump up sea-water from the bottom to mix with the sewage water. This would increase the volume and gravity of the latter, and thus render it harmless. His principal advocacy of this elaborate arrangement is based on its cheapness, as compared with the costly one proposed by the city engineer. Whatever will be the result of these deliberations, it is admitted on all sides that the immediate settlement of the fecal and sewage questions in Copenhagen is urgently demanded.

**ELECTRICAL SANITATION AT WORTHING.**—The Town Council of Worthing have voted a considerable sum of money to enable M. Hermite, the celebrated French Sanitary Engineer, whose method has proved so successful at Havre, Lorient, &c., to get to work during the present month to demonstrate the efficiency of his system of sewage disinfection, by means of electrolysed sea-water, for the first time in an English town.

**FILTRATION WORKS, MANCHESTER.**—We are informed that the tender of Mr. Geo. Bell, Tottenham, London, for the works of the filtration area for the Manchester Corporation at Davyhulme has been accepted. The work consists of about 100,000 cu. yds. of excavation, twenty miles of piping, and a large quantity of Portland cement concrete, and other works. The works have to be completed in four months.

**DRAINAGE SCHEME FOR BRIDLEY HILL.**—At a recent meeting of the Bridley Hill Local Board a comprehensive drainage scheme was submitted by Mr. J. Edward Wilcox, C.E., of Birmingham. At present the sewerage on the north side of the town is taken beneath the railway in a culvert, and flows down what was till lately an open brook course to the outfall works, which consist of settling-tanks and strainers, the sewage passing upwards and downwards through beds of gravel and coke or charcoal, and the effluent flowing direct to the canal, the arm or basin into which it formerly discharged having been lately filled up, owing to the nuisance arising therefrom. On the south side the whole of the sewage flows direct to the canal or under it to the stream below, there being no treatment of any of the sewage on this side of the district. In order to utilise the existing sewers it would be necessary to construct very large and very costly outfall and intercepting sewers, and Mr. Wilcox, therefore, recommended that the existing sewers be abandoned for sewage purposes, but retained for the conveyance of surface water to the canals, and a new system of small pipe sewers with self-cleansing gradients be put down for sewage purposes only. These will cost no more than the large intercepting and outfall sewers, and the expenditure at the sewage disposal works will be very largely reduced, both as to initial cost and annual expenditure. If the Board should decide to deal with their own sewage, he recommended the adoption of the International system, as the land treatment was out of the question.

**THE SHAP GRANITE AND PATENT CONCRETE CO.**—In a paragraph last week in which we mentioned the productions of this firm, and its London agents, Messrs. E. J. Van Praagh & Co., the name was given as the "Glass Granite," &c., Co. by a printer's error which escaped notice. The correct title of the company is as above.

FOREIGN AND COLONIAL.

**FRANCE.**—M. Puvion de Chavannes has been re-elected President of the Société Nationale des Beaux-Arts; the two Vice-Presidents, MM. Carolus Duran and Rodin, have also been re-elected. M. Waltner has been elected one of the Vice-Presidents in place of M. Braquemond (resigned), and M. Cazin is the Vice-President of the section of Decorative Art. MM. Jean Beraud and Billotte, the Secretaries, and M. Duhaute, the Treasurer, have retained their positions. A new intercepting sewer, called the "Egout de Clichy," is to be made in connexion with the Paris Drainage System; a vote of 5,600,000 francs having been made for the work. The sewer will start from the Quai de la Tournelle and end near the pumping station at Clichy, passing by the Place de la Concorde, Rue d'Amsterdam, Place Moncey, Avenue de Clichy and Boulevard National.—The exhibition of painting and sculpture of the Cercle Volney has just opened, and is to close on February 22.—M. Ginain, the architect of the Musée Galliera (illustrated in the *Builder* last week) has been created an officer of the Legion of Honour.—A monument is to be raised by subscription to the memory of César Franck, the organist and composer, who died two years ago.—The Chamber of Deputies has before it a project for a strategic railway from Fayet to Chamounix and thence to the Swiss frontier.—The Russian visitors who usually winter at Cannes, have founded a Russian church there, on the Boulevard Notre Dame des Pirs.—The French Government has commissioned M. Guillaume, the director of the Académie de France at Rome, to direct the restoration of the frescoes in the church of "St. Louis des Français" at Rome. It is announced that this work is now completed. The paintings "restored" were the work of Domenichino.—M. Rochet, architect, of the Department of "Assistance Publique," has just completed a new hospital at Epervan, built at the expense of M. Auban Moët, the well-known champagne merchant. It has cost about 3 million francs. The death is announced of M. Petit, architect, the father of M. Albert Petit, architect to the Versailles Palace.—M. Chartrain, the painter, has commenced a portrait of the President of the Republic for the next Salon.

**DENMARK.**—Of the 3,000,000 Kr. voted by the Municipality of Copenhagen for the new Town Hall a sum of 800,000 Kr. is to be expended during the current year.—A sum of 350,000 Kr. has also been voted for the new prison-house in Copenhagen, being the balance of the estimated cost, viz.: 1,350,000 Kr. This building is now fast approaching completion. There will be about 600 cells, all constructed on the most modern system. They measure 12 ft. in length and 6 ft. in width, with a separate water-closet to each. They are well ventilated and heated, and the windows much larger than in ordinary prisons. The building is surrounded by a 20-ft. brick wall. This prison is only intended for male offenders, but a similar one is to be erected on the same site for female prisoners. It is expected that the building will be completed by the end of 1895, when the prison at Christianshavn will be closed. The architect is the well-known Professor Fenger, and the cost of the structure complete is estimated at about 6,000,000 Kr.—The Institute of the Museum of Art and Industry in Copenhagen, is to be decorated with eighteen columns of polished marble, executed at the Mechanical Stone-Cutting Works, Copenhagen, in different colours.—We mentioned some while ago that a wealthy Dane residing abroad had offered to pay the cost of gilding the dome of the great new "Marble Church" in Copenhagen, and this work has now been commenced. The statues at the entrance are also now being mounted. In the interior one half of the mosaic floor has been finished, and the heating apparatus is now being installed. The models of the two great bronze statues for the exterior have been cast in plaster, the sculptors being Professors Stein and Bissen, and the working drawings for the altar are likewise completed. Every effort is being made to have the edifice ready for service by next Whit Sunday.—The new Glyptothek in Copenhagen, an art gallery presented to the town by Herr Carl Jacobsen, is approaching completion.—The Danish House of Parliament was partly redecorated, and the heating apparatus greatly improved last autumn.—An industrial and crafts exhibition has been held in the town of Kjøge, and an electrical one in the town of Odense.—A new communal hospital has been completed in the town of Aarhus, at a cost of 400,000 Kr. It is suitably situated on a hill overlooking the town, and is said to be the most perfect hospital in Denmark. There are two isolated buildings for epidemic cases. In the basement of the main building there are public baths. The architect and builder is Herr Arboe.—A new church has been erected in the town of Løgstør by Herr Monme and Herr Olsen, architects. The style is Gothic, and the material used red brick. The cost has been 55,000 Kr., the site being free. The height is 150 ft.—The old "Raadhús," or Town Hall, in Næstved is being restored at a cost of 5,600 Kr. The oldest portion dates from the twelfth century, but other parts are only about 200 years old. Some paintings and encaustics in chalk have come to light.—Two great engineering works have just been completed in the Danish



THE SLOLDOUCHIN POUDRETTE FACTORY, ST. PETERSBURG.—One day last month M. G. A. Soloduchin invited the civic authorities of St. Petersburg to inspect his poudrette factory in the Ssenseno-place. The poudrette is manufactured from the refuse from the city on principles somewhat similar to those followed in the process recently described in the *Builder*, but Soloduchin's factory has been in operation since 1875. The factory receives all the fecal matter from the barracks of the Life Guards, as well as from the garrison of the city. The fecal manure, the former being pumped through mains into the factory. It is now Soloduchin's plan to attempt the extension of this system to the whole of St. Petersburg should the Municipal Authorities approve the scheme; but, of course, the existing small factory would not be sufficient to deal with such quantities. The scheme would be carried out somewhat on the principles of the Lienen method, adopted in certain Dutch towns. The present factory is only capable of treating dry fecal matter, and the city there would also be a quantity of waste water. The following illustrations of the process carried out before the Municipal Authorities were very successful. In the course of twelve minutes 450 cubic feet of fecal matter was by pneumatic methods pumped into a large cylindrical tank, heated through pipes and boilers in which heated cylinders were placed in the short space of ten minutes the entire mass was







LONDON.—For steel and iron-work in girders, joists, roof-trusses, columns, &c., to the new bridge and washhouse, Tottenham, London, N., for the Boys and Washhouse Commissioners, for the parish of St. Mary's, Islington. Mr. A. Hessel Tilman, architect, 7, Foregate Square.

Borman & Long, £2,700 15 3 A. Dawney, £2,480 15 7  
R. Moreland & Co., £2,700 15 3 Matt Shaw & Co., £2,360 10 5  
Sons, £2,557 10 0 Accepted.  
H. Linday, Neale, & Co., £2,541 14 7

For the new steel Lancashire Bridge, The Leeds Boiler

A. Anderson, £2,145 0 0 The Leeds Boiler £2,001 0 0  
Sons, £2,000 0 0 Robert Taylor & Sons, £2,800 0 0  
Spurr, Inman, & Co., £2,093 7 6 Accepted.

Including wash-house, metals, drying closets, engines, laundry, and other machinery and piping for heating and warming generally.

	£	s.	d.		£	s.	d.
Taylor & Sons	8,557	10	0	A. Osborne & Co.	5,731	0	0
Marper Twelvemans	8,201	12	8	D. W. Forbes & Co.	5,350	0	0
Sugg & Co.	8,068	12	6	J. F. Cullen	5,158	0	0
Summerscales & Sons	7,968	0	0	H. Roberts, Smith	5,095	0	0
Wenham & Walters	7,490	0	0	B. Cooke & Co.	5,075	0	0
Rosser & Russell	7,298	0	0	W. Coker	5,035	0	0
John Fraser & Sons	7,260	0	0	A. Osborne & Co.	5,025	0	0
Benham & Sons	7,180	0	0	B. Cooke & Co.	5,025	0	0
Purcell & Nobbs	6,800	0	0	W. Coker	5,025	0	0
T. D. Barry & Sons	6,680	0	0	A. Osborne & Co.	5,025	0	0
T. Bradford & Co.	6,500	0	0	B. Cooke & Co.	5,025	0	0
Russell & Co.	6,480	0	0	W. Coker	5,025	0	0
J. & F. May	6,165	0	0	A. Osborne & Co.	5,025	0	0
J. F. Clarke & Sons	5,700	0	0	B. Cooke & Co.	5,025	0	0
Atterdock & Cameron	5,310	0	0	W. Coker	5,025	0	0
A.—Extra if wash-house metals and troughs are power barbed							
A.—Extra if wash-house metals and troughs are enamelled							

Accepted.

LONDON.—For new premises, Brewery-road, N. Mr. W. Tignor, architect, Enth. Kent.

Mowlem & Co., £2,712 10 0 Gregor & Son, £7,190

Holliday & Greenwood, £7,597 Kie & Randall, £7,597

Atterdock & Cameron, £7,490 J. O. Richardson, £6,230

Williams & Son, £7,490 Bailey, Son, & Holmes, £6,374

LONDON.—For the construction of Turkish baths at Broad-

street House, Old Broad-street, E.C. for Messrs. J. & H. Nevill, Mr. G. Harold Elphick, architect, Broad-street House.

Quantities by Messrs. Hutcheon, 10, Cannon-street, E.C. 1.

Farmer & Sons, £5,150 0 0 Macfarlane Bros., £5,000 0 0

Kirk & Randall, £5,000 0 0 Woodward & Co., £4,840 0 0

Stanley Bird, £5,000 0 0 J. O. Richardson, £4,731 0 0

H. Lovatt, £5,000 0 0 William Downes, £4,670 0 0

W. H. Lascelles & Co., £5,000 0 0 Accepted.

LONDON.—For alterations to premises, 2-3-11, 10, North-

ington, N. For W. H. Rastrow, Mr. F. Papet, architect, 9, St. John Street, A. Elph. W.

Crutman & Son, £2,397 Houghton & Sons, £2,157

Williams & Son, £2,153 McCormick & Son, £2,088

Deaning & Son, £2,153 MacFarlane Bros., £2,088

H. Lascelles & Son, £2,153 Accepted.

LONDON.—For alterations to shop-front and fittings, &c., to No. 16, Cornhill. Messrs. Wadmore, Wadmore, & Mallett, architects, 35, Great St. Helens, E.C. 1.

Clark & Barclay, £1,150 0 0 Screener & Co., £1,125 0 0

F. Sage & Co., £1,150 0 0 Drew & Cadman, £1,100 0 0

W. H. Lascelles & Co., £1,145 Ashby Bros., £995 0 0

Accepted.

LONDON.—For alterations to No. 12, Fenchurch-street, for the

Aerated Bread Company. Mr. G. Edwards, architect.

Albion Works & Co., £1,248 13 3 Scharen & Co., £1,085 8 8

Colls & Son, £1,150 0 0 Ward & Lambie, £1,000 0 0

S. Knight, £1,150 0 0 J. L. Stevens, £971 0 0

A. W. J., £1,150 0 0 Stimpson & Co., £971 0 0

Accepted.

LONDON.—For fitting up a dairy shop, at new premises

to be used for the purpose of a dairy shop, for Mr. J. W. Lane, of Manor Farm, Hylgate. Mr. F. W. Lane, architect, 157,

Albion road, Stoke Newington, N.

Hew & Cadman, £2,479 Sage & Co., £2,448

Godfrey Gyles & Co., £2,479 F. Voller (accepted), £397

Lascelles & Co., £457 Accepted.

NEWCASTLE-ON-TYNE.—For the erection of the "Burr" hall

and offices, Northumberland, for Mr. J. W. Lane, of the

Association. Mr. Jno. W. Dixon, architect, 15, Grainger-street,

Newcastle-on-Tyne, accepted by the architect.

W. C. Tyrie, £5,550 2 0 John Ferguson, £5,515 0 0

J. T. Hobson, £5,550 2 0 S. B. Burton, New, £5,420 16 8

Middleton Bros., £5,515 0 0 Castle, £5,420 16 8

Thos. Weatherill, £5,515 0 0 Accepted.

A. Scott, £5,515 0 0 M. Gibson, £5,474 5 6

J. T. Hobson, £5,515 0 0 Stephen Percy, New, £5,474 5 6

W. Walker & Sons, £5,515 0 0 Castle, £5,474 5 6

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Middleton Bros., £5,515 0 0 Castle, £5,420 16 8

Thos. Weatherill, £5,515 0 0 Accepted.

PAIGNTON (Devon).—For new vicarage, Christ Church, Paignton. Messrs. G. Soudon Bridgman & Norman G. Bridgman, architects, Torquay and Paignton.

W. A. Goss, £1,811 0 0 E. P. Bovey, £1,600 0 0  
W. A. Goss, £1,811 0 0 E. P. Bovey, £1,600 0 0  
Rabbitt & Brown, £1,647 0 0 Drew Bros., £1,599 0 0  
G. Webber & Maudslayi, £1,625 0 0 H. Webber & Son, £1,597 0 0

PORTSMOUTH.—For additions, &c., to school buildings,

Penhale-road, for the School Board. Mr. Alfred H. Bone, archi-

tect, Cambridge Junction, Portsmouth. Quantities by architect.

T. W. Quick, £1,500 0 0 E. & A. Springings, £1,500 0 0

J. F. Cullen, £1,500 0 0 J. E. & A. Springings, £1,500 0 0

W. A. Knight, £1,500 0 0 J. E. & A. Springings, £1,500 0 0

W. W. Learmouth, £1,500 0 0 J. E. & A. Springings, £1,500 0 0

H. Willcox & Co., £1,500 0 0 H. Jones, For-

mouth (accepted), £1,500 0 0

J. W. Perkins, £1,500 0 0 H. Jones, For-

mouth (accepted), £1,500 0 0

SANDWICH.—For the erection of reservoir engine-house,

cottage, and providing and laying pipes and fittings, for the Corporation.

Messrs. Easton & Anderson, engineers, 3, Whitchurch-place, S.W.

Contract No. 2, 1894, &c.

A. Osborne & Co., £5,731 0 0 T. V. Bond, £5,095 0 0

D. W. Forbes & Co., £5,350 0 0 H. Roberts, Smith, £5,095 0 0

J. F. Cullen, £5,158 0 0 Wick (accepted), £5,095 0 0

B. Cooke & Co., £5,075 0 0 W. Meats, £5,095 0 0

W. Coker, £5,035 0 0 L. H. Green, £5,095 0 0

Contract No. 3, 1894, &c.

A. Osborne & Co., £5,423 14 9 H. Roberts, Smith, £5,095 0 0

B. Cooke & Co., £5,423 14 9 Wick, £5,095 0 0

W. Coker, £5,035 0 0 L. H. Green, £5,095 0 0

Accepted.

SOUTHEND.—For levelling, channelling, paving, &c., Haring-

ton-road, for the Corporation. Mr. C. T. Copple, Borough Surveyor, Clarence-road, Southend.

Brindley & Lake, £7,044 0 0 W. Dutton, £5,167 4 4

W. Griffiths, £6,110 15 1 E. Lees, £5,167 4 4

F. Dupont, £6,110 15 1 E. Lees, £5,167 4 4

Accepted.

TORQUAY.—For new banking premises for the Devon and

Cornwall Banking Company, Limited. Messrs. G. Soudon

Bridgman and Norman G. Bridgman, architects, Torquay and

Paignton.

J. Finch, £4,500 0 0 E. P. Bovey, £3,166 15 1

C. R. E. Drew, £3,645 0 0 J. Saunter, £3,009 10 0

E. Westlake, £3,595 0 0 Rabbitt & Brown, £3,036 0 0

H. Webber, £3,575 0 0 Vanstone & Mumford, £3,036 0 0

J. Chubb, £3,575 0 0 Torquay (accepted), £3,036 0 0

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# The Builder.

VOL. LXXI. NO. 2699.

JANUARY 27, 1891.

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Municipal Technical School, Manchester.—Messrs. Spalding & Cross, Architects .....	Double-Page Photo-Litho.
Wayside Notes in East Anglia.—By Mr. J. S. Corder .....	Double-Page Photo-Litho.
Wayside Notes in East Anglia.—By Mr. J. S. Corder .....	Single-Page Photo-Litho.
Tullie House, Carlisle, The Castle-street Front.—Mr. C. J. Ferguson, F.S.A., Architect .....	Single-Page Photo-Litho.

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### "London Streets and Buildings" Bill.



WE have already dealt with the main drift of the Bill, page 461, in our last volume, and given it a kind of second reading, thinking there is reasonable promise of a

useful Act. We have, however, suggested that there are slips of the pen, defects in wording and vagueness where definiteness would be better; also that there are points about which strenuous argument would be desirable. In order that the main provisions may be thoroughly understood by all, without everyone going through the labour of the study, we propose to deal with some of the more important subjects in separate form and at very moderate length, pointing out what is now proposed by the London County Council, the changes from the existing law, some reasons for the changes, and reasons against them when necessary. It is quite possible to have too much of such a subject all at once, but for some amount of correspondence we shall be happy to find room. In legislation it is quite as necessary to know what people actually think, as to know what they ought to think, or what would, in the abstract, be the best thing for them. The Act, when passed, will most probably remain in force (except as amended) for at least twenty years, and should for every reason start accepted as a model in drift, framework, and all details. Those interested in London and its buildings should take pains to mature and express their views, now they have a definite text before them. We had better submit a little longer to the ills we have, rather than that Parliament should hurriedly pass something or other. There was little choice in 1855; the deadlock itself would have justified speedy legislation; things could hardly be made worse by a stop-gap. The shapeless, somewhat incoherent measure has done duty for nearly forty years. It would probably not have ranked higher than the Act of 1774 if the Bill of 1870 had passed into law; now it will have all the honours accorded to anything of long standing. There is now no

run against time. The proposed measure should reach the building world by easy introductions. These may help the way to a cheerful acceptance of the situation, and to the new Act being received as pleasantly as may be, and never regarded as an unpleasant step-mother, compliance with whose requirements would be against the grain.

It was suggested at the R.I.B.A. meeting on December 4, when some Building Act matters were touched upon, that "it would be better to have the definitions so fixed that they could all understand what the Act meant, instead of requiring a tribunal to appeal to at all." Whether the remark was meant seriously we cannot say; but we do not think an Act devoted to meeting every possible case would be likely to prove a good working one. In the preamble to the proposed Bill the existing law is credited with "provisions complicated and in some respects doubtful." It is not clear what "doubtful" means, but the whole means something not quite respectful to parts of it. "Complicated and doubtful" provisions should certainly be avoided as much as possible; but the application of the best possible clauses, to the special cases which will come up, will be sure to give rise to difficulties. Acts which provide for very many exceptions are almost useless; ingenious persons will work hard at the destruction of the remainder, and succeed very well when magistrates only half understand the differences between the cases they are called upon to decide.

In interpreting the Act the Tribunal of Appeal, the magistrate, and the judges will have the help of a preamble, in which the objects aimed at by Parliament are stated in some detail. This kind of help has not been available of late years. The Act of 1774 had a sturdy little preamble. The Act of 1844 had a somewhat elaborate one. The Act of 1855, the main Act still in force, though supplemented by half-a-score of other Acts, had the most meagre of possible preambles. It was simply stated that it was expedient that the laws relating to buildings in the Metropolis and its neighbourhood should be amended; and no reasons were given to account for the actual enactments. It has, in consequence, been argued from time to time that, there being no preamble, the exact wording is the only

possible guide. Sometimes the argument is carried still further, and it is contended that a reading, although directly antagonistic to the supposed purposes of the Act, should be accepted unhesitatingly—if the weight of the wording in the Act is not clearly against the defendant, in a District Surveyor's action. In support of this view it is pointed out that it is apparently impossible to account for some of the decisions by magistrates and judges in any other way.

The often-quoted statement that "the preamble is a good mean to find out the meaning of the statute, and is a key to open the understanding thereof," is probably as true now as when it was given out; that is, if the preamble is a really good one with full comprehensive wording, not one in which the desire of brevity has resulted in obscurity. In the following ampler authoritative exposition of the use of a preamble, it is laid down that the meaning of the Legislature should only be sought in the preamble when there is any ambiguity in the existing part; and it is delicately implied that if all the aims are not fully stated in the preamble, the decision will, when the preamble is so consulted, not go beyond what can be deduced from the aims which are clearly stated.

"The Court ought to give effect to the preamble to this extent, namely, that it shows what the Legislature are intending; and if the words of enactment have a meaning which does not go beyond the preamble, or which may come up to the preamble, that meaning should be preferred to one showing an intention of the Legislature which would not answer the purpose of the preamble, or which would go beyond. To that extent is the preamble material." (West Ham [Overseers] v. Iles.)

The preamble of the proposed Bill states as mentioned before, that the present Acts are in parts unsatisfactory, and that their repeal is desirable; also that "further provisions should be made and powers conferred in order to secure a proper width and direction of streets, the sound construction of buildings, the diminution of the danger arising from fire, the securing of more light, air, and space round buildings." . . . Now, as a permanent guide to the main intentions of the framers of such an Act, such a preamble is manifestly incomplete, and though the succeeding clause—

"And generally with respect to the control and regulation of streets and buildings, and otherwise as in this Act set forth"—



is a pretty sweeping one, it throws no additional light on intentions. "The utmost possible encouragement, and the least possible hindrance to intelligent new building"; "the fair adjustment of the rights of the joint owners of party structures"; and similar sentences, would look well in such a preamble, and might have good effect. In the preamble to the 1844 Act, "to increase the Expense, and to retard the Operations of Persons engaged in building" were mentioned unfavourably. Parliament is to be asked (sec. 136) to give authority to the Council to make by-laws with respect to "relaxation or adaptation of various provisions of this Act in their application to special or exceptional cases." We shall in time see what this can be made to mean. It is a very elastic provision as it stands, and might be kept in rightful course by other words from the preamble to the 1844 Act, ordaining that there may be exercised "in certain Cases, and under certain Checks and Control, a Discretion in the Relaxation of the fixed Rules, where strict Observance thereof is impracticable, or would defeat the Object of this Act," or would needlessly affect with Injury the Course and Operation of this Branch of Business."

Of course minor subjects do not deserve to be named in any preamble; but, once started, a good ample range is logical and desirable. As a whole generation, if not more, will, no doubt, be bound in the fetters now being forged, we should not now object (and later on no one would object), to the introduction of the idea of "amenity" into the preamble. Wide streets, removal of dilapidated and neglected structures, limitations in the height of buildings, the prohibition of sky signs, the limitation of advertisement—quite a number of regulations for the promotion of comeliness and propriety—have their places in the proposed Bill. But the reasons for them are not generally stated, though occasionally hinted at to a reader between the lines. For instance, neglected structures, ruinous and dilapidated, unfit for use or occupation, when from neglect they reach "a structural condition prejudicial to the property or to the inhabitants of the neighbourhood" (Sec. 97), may be dealt with effectually. The Third Schedule arranges for "local evidence to satisfy the magistrate that the condition of the property is prejudicial, &c." It will be possible to glean from this that a neglected structure is not always regarded by the Legislature as an agreeable object. But why is it necessary to take pains to show, or affect, any indifference, in a Building Act, as to London's being a good-looking, pleasant place?

#### THE LATE M. CÉSAR DALY.

**M**ANY of our readers will learn with regret of the death of this veteran French architect and architectural writer, who only eighteen months ago received the Gold Medal of the Institute of British Architects from the hands of its President, and acknowledged the honour in probably the most remarkable extempore address which had ever been heard in that room; and who died at his country residence at Wissous, a few miles out of Paris, on the 11th of this month, at the age of 83.

At the time when the Institute medal was presented to M. Daly a good many particulars as to his life and work, embodied in the address of the President of the Institute, were printed in our columns,\* and in devoting a few words to his memory here we may avoid recapitulating details so recently given, and endeavour rather to add to these some personal recollections of his character.

César Daly, who was born at Verdun in 1811, was the son of an English officer who was a prisoner of war in France, and married a French lady. The name Daly, however, as everyone knows, is an old Irish one, and César Daly always maintained

that he was Irish by descent; and one traditional Irish quality he certainly exhibited in that power of fluent oratory which he possessed in so remarkable a degree. As mentioned in the Presidential address before alluded to, Daly spent the years of his boyhood in England, and retained the habit of speaking English so much during his life that at one time, his sons being also taught English well, there was more English than French spoken in the home circle; though latterly this was not so.

The main points of César Daly's professional education, at the École Polytechnique and subsequently under Duban, we have before recorded. His actual work as an architect was not extensive, the restoration of the Cathedral of Alby, to which he was appointed in 1840 under the Department of "Monuments Historiques," being his chief work of this kind. A number of drawings of this building and its restoration were exhibited by him at the Salon of 1846 and the general exhibition of 1855, where he obtained a "Seconde Médaille" for them; and he was named Chevalier of the Legion of Honour in 1861. He was for some months principal secretary of the Société Centrale des Architectes, after 1848, but did not attend the meetings very often. The fact was that he was of too restless and energetic a spirit, and took interest in too many different subjects, to confine himself within the regular lines of professional practice. But he found an admirable outlet for some of his best powers in the architectural periodical, the *Revue Générale de l'Architecture*, which he had founded in 1839; a folio periodical which would have been called a monthly one in England, but which appeared twelve times a year with that easy-going irregularity as to stated dates which the habits of French periodical literature seem to allow, and which has its advantages as well as its disadvantages. The establishment of the *Revue* coincided to a great extent with the commencement in France of the "romantic movement" in art. It was published at first by Paulin & Hetzel père, the publishers of *L'Illustration*; after 1843 it was published for some time by the editor himself, then successively by the houses of Morel & Cie., Ducher & Cie., and lastly by that of André Daly fils & Cie. In its earlier days the *Revue* was more devoted to scientific, archaeological and historical subjects, and less to illustration, than in its later days, when the illustrations of contemporary architectural work became an important feature, and were produced with an excellence of method and execution which has never been surpassed. Picturesque illustrations in perspective, so popular in England, were not much represented in the *Revue*, which rather favoured finely-drawn geometrical elevations and detail drawings. It became also the recognised organ for the expression of opinions on architecture among the leading men of the day who were interested in art, such as Viollet-le-Duc, Prosper Mérimée, Albert Lenoir, Beulé, Comte de Laborde, Constant-Dufeux, Ruprich-Robert, and others. The literary portion of the *Revue* was still mostly occupied with articles on what may be called the "higher criticism" of architecture; and it was in order to provide for the consideration of more practical subjects that the excellent weekly publication, the *Semaine des Constructeurs*, was started, conducted by César Daly in conjunction, either at first or afterwards, with his son M. Marcel Daly, under whose editorship the *Semaine* still continues its course. The *Revue*, which was essentially a personal production of César Daly, appears to have been allowed to drop two or three years ago, when its founder became unequal to the constant strain of keeping it up to its original level; it was perhaps too personal a work to be well carried on by anyone except its originator. It was characteristic of the energy of its editor—characteristic also of the French interest in art even in the most untoward circumstances, that the work of the *Revue* was kept up, and

the periodical issued as usual, during the whole of the terrible period of the siege of Paris in the Franco-German war.

César Daly's most important architectural publication next to the *Revue*, was his fine illustrative work "Motifs Historiques," consisting of a collection of splendidly engraved examples of the various styles of the French Renaissance, taken from existing examples mostly in Paris, and valuable also as preserving a record of many old features of Paris architecture of the fifteenth, sixteenth, and seventeenth centuries. Some of these have already perished, and others doubtless are destined to follow in the course of modern Parisian improvements. To this work we devoted an article in the *Builder* for March 16, 1889.

Daly was a man of remarkable energy of mind and body, as may be judged from the fact that in his eightieth year he planned and made every arrangement, financial and otherwise, to found and carry through a dictionary of architecture on a scale of completeness such as had never before been projected. His one physical weakness was a tendency to bronchial illness, which in latter years especially made the state of the weather a very important factor in regard to his health and his capacity for work; and it was probably the recent cold, which was severely felt in Paris and its neighbourhood, which was mainly instrumental in ending his life. Apart from that influence, he was always in activity; a great traveller, with a resolution as far as possible to see all things for himself; and we remember the late Mr. Godwin, who had known him well for many years, remarking, "If you call to see Daly, it is just a toss-up whether he is in bed with a cold, or whether he is away studying the aboriginal architecture of Kamtschatka." When his *Revue* was first founded, he made it a special feature of the financial arrangements that a certain sum should be set apart every year for the editor's travelling expenses, as he must insist on seeing everything for himself and not through other people's spectacles; and he had stories to tell of his experiences and adventures in almost every part of the habitable world, civilised or uncivilised, generally with some bearing on art or architecture. We remember particularly a most dramatic account, given in his garden at Wissous one summer afternoon, of his being present at a great function of Red Indians, when the chief of the tribe, standing in the centre of a circle of hearers, punctuated each sentence of his address by a kind of shout, at the same time turning a little so as to face another portion of his circle of listeners, which circle itself turned so as to follow him, till the whole crowd had come to circling round at regular intervals, after each shout; an example, he maintained, of the inherent tendency to form and rhythm in humanity. When exploring in Egypt he astonished the local French officials by his untiring energy, and related with evident enjoyment how one of them, in giving the route to a party for certain temples, added, "but you cannot possibly see them in one day, unless you have *le diable au corps*, like Daly."

It was about thirty years ago that César Daly established himself in the house at Wissous where his friends of recent years knew him. It was, as he himself told us, mainly from the necessity of having more undisturbed leisure for work that he quitted Paris. His genial character and overflowing hospitality (the latter perhaps, like his fluent speaking, a traditional Irish trait) made him more friends than he could find time for, and in the Paris days it was not an unusual thing to have fifteen to twenty guests at *déjeuner*, which, though pleasant, did not conduce to study. In seeking a quiet spot, he could certainly hardly have managed better than he did. It was in 1889, the exhibition year, that we made our first personal acquaintance with the *confrère* (as the French pleasantly express it) with whom we had long corresponded, in response to a

\* *Builder*, July 9, 1892.



cordial invitation that we would make Wissous our home during our visit to the exhibition. To say truth, we had to stop in Paris two or three days and do a little steady exhibitionising first, for Wissous was a little too inaccessible for journalising the exhibition from. The railway access to it was by way of the old *Gare de Secaux*, now advanced into Paris as a new terminus, but then an *ultima thule* to which the Parisian cabmen could with difficulty be bribed to drive one. A slow, stopping train brought one at length to the small characteristically French country town of Antony, with its white-shuttered houses and broad paved streets with not a soul to be seen in them, and a drive in a country omnibus through the bare-looking unfenced country to the little hamlet of Wissous, with its odd little Late Gothic church. Adjoining the village our friend had found an old French country house, which he had altered and added to, putting a grille flanked by exactly symmetrical lodges towards the little street. Inside this a courtyard gave access to the double ramp of external stone steps leading up to the house door, and on the other side of the house was a large garden, laid out when what were then called "English gardens" were the fashion in France, with winding walks, shrubberies, a "wilderness," clumps of trees, and a little artificial "mount" near the extremity, whence Paris, on clear days, just asserted itself in the shape of the outline of the Eiffel Tower in the distance. On the first floor our host had his suite of rooms, forming a library, packed as close as they could with every sort of book on architecture. No place could be more quiet, no seclusion more complete. Of the kindness we received from host and hostess this is not the place to speak, but both visitors (for we were two), remember it as one of the happiest weeks in their life.

This home of study and leisure combined suffered sad havoc during the Franco-German War. There was no staying there, and all that could be carried into Paris was conveyed away, and the house left to become the quarters of a troop of German cavalry. When the owners returned after the war, scarcely more than the shell of the building was left. All the doors and windows had gone, the very frames torn out of the walls, and the flooring boards even torn up in many places—of course for firewood. One incident of the occupation our host told with much enjoyment, though the laugh was against himself. He had buried all his valuable store of wine very artistically in the garden, making up the ground very carefully over it. The gardener, who had his own little stock of *vin ordinaire*, followed this example, but unfortunately did not perform the burial so carefully, and one of the enemy's horses put his foot through the turf into the gardener's claret-bottles. On this hint the whole garden was diligently trenched across, and the whole stock of wine discovered and looted. We heard much from our host about his experiences in Paris at the time, and some of his remarks were curiously illustrative of the matter-of-fact way in which revolutions are regarded in France. When the Commune insurrection broke out M. Daly was away from Paris, and hearing what was going on from a friend who had just come from the city, he merely asked "What is their programme?" "O! they have no programme" was the answer, "except general destruction." "In that case we must resist them," he said, "there must be some definite programme"; but otherwise we gathered that he would have quietly accepted the Communist rule in default for the moment of any other form of Government.

The funeral of M. Daly, (a strictly secular one, for the deceased held the general attitude of Republican France towards the church) took place on Sunday, the *cortège* starting from the publishing house of André Daly fils et cie, 51, Rue des Ecoles, and repairing to the crematorium at Père Lachaise Cemetery, where, after the melancholy ceremony was completed, four

addresses were delivered; the first a short written one by M. Daumet, read for him by M. Chas. Lucas as his representative; the others were extempore speeches by M. Guyes, engineer of the marine service; M. Caumeau, municipal councillor of Paris; and M. de Barral. M. Daumet's discourse we are enabled to give as it was read:—

"Messieurs,  
"Je viens au nom des membres de la Société Centrale des Architectes français apporter un dernier hommage à M. César Daly, dont la personnalité depuis plus d'un demi-siècle a laissé une trace lumineuse parmi les artistes et les écrivains.

"Théoricien très alerte, il a abordé des premiers avec succès tout ce qui intéressait l'art de bâtir ainsi que les moyens modernes de construction. En 1839, il fonda—et c'est son œuvre magistrale—*La Revue Générale de l'Architecture et des Travaux Publics*. Poursuivie pendant 55 ans, cette publication, la première faite dans la forme artistique et pratique, traitait depuis l'esthétique la plus élevée jusqu'aux problèmes les plus usuels de la construction. Cette *Revue*, éditée avec des soins particuliers, accompagnée de planches finement gravées, rendait compte des Concours publics, des applications alors nouvelles à des constructions dont les métaux étaient les éléments principaux; elle propagait avec succès cette idée qu'il était indispensable pour l'architecte, de s'approprier ce que la science de l'ingénieur a d'adaptable à la construction des édifices publics et des habitations privées.

"Cette publication a rendu d'importantes services; elle a été l'un des plus surs moyens de propagande des méthodes d'étude de notre art professionnel. Aussi les imitations ont été nombreuses. On peut donc affirmer que M. César Daly a été un précurseur en ce qui concerne les publications relatives à l'architecture.

"Élève du plus éminent architecte au temps de ses études, de M. Duban, M. César Daly se trouva au milieu de toute une phélie d'artistes; les tendances de son esprit, son besoin de mouvement, l'engageant à entreprendre des voyages; il les fit lointains et étudia les monuments de toutes les époques.

"Pendant 25 ans, il appliquait sa science aux travaux de restauration de la cathédrale d'Alby; sa notoriété s'entendait et il devenait membre correspondant de la plupart des Académies à l'étranger et de nombreuses Sociétés archéologiques; ses distinctions honorifiques affluèrent, venant témoigner combien ses mérites étaient appréciés hors de France. Enfin l'année 1892 devenait pour lui décisive, il recevait la grande médaille d'or de la Reine d'Angleterre, la plus haute récompense professionnelle dont un architecte puisse être l'objet de la part de l'Institut royal des Architectes britanniques. La Société Centrale des Architectes français joignait à cette occasion son hommage à ceux qui parvenaient à M. César Daly.

"Aujourd'hui, Messieurs, ne pouvant plus ajouter aux éloges que méritait notre confrère, nous nous tournons vers ses fils en leur témoignant, pour Madame César Daly et pour eux, nos regrets d'une si douloureuse séparation."

The editor of this journal desires to add his own expression of appreciation of the remarkable character and breadth of intellectual culture which distinguished M. Daly, in whose death he has also to regret the loss of one of the best and sincerest friends he has ever known.

Besides his widow, M. César Daly leaves three sons: M. Marcel Daly, engineer and architect, and editor of the *Semaine des Constructeurs*, and who is also an expert in electrical work and in French building law; M. Victor Daly, who is a partner in the publishing house of André, Daly fils, & Cie., and M. Raymond Daly, advocate in the "Cour d'Appel" of Paris. H. H. S.

#### NOTES.

THE action of the Committee of the Thames and Severn Canal—otherwise the Great Western Railway Company, the holders of seven-eighths of the shares—in giving notice of their intention to close the greater part of this waterway "for the present," has aroused strong opposition on the part of the various Chambers of Commerce and other bodies interested. The railway company profess to have acquired their interest in the property with a view to preventing its being closed as a navigation, and state that they now find that with the exception of the three-mile section between Stroud and Chalford it is unremunerative. The clause in the Act of 1838 relating to "derelict" canals could be

applied in the event of an application for a warrant of abandonment being made, and the Board of Trade will probably endeavour to bring this about should the company neglect to maintain the navigation. The Act provides that "a derelict canal, or any part thereof, may be transferred to any body or local authority," and a member of the deputation which Sir Michael Hicks - Beach introduced to the President of the Board of Trade last week stated that the various bodies interested were prepared to form a trust for the purpose of maintaining the canal, as a part of the through water communication from east to west. In 1888 there were about forty canals, with an aggregate length of 1,436 miles, under the direct control of the railways, but the Act of that year prohibited railway companies from applying any further funds to the acquisition of canal interests, without express statutory authority. In view of the disastrous effects of railway proprietorship upon the utility of waterways, this would seem to be a very necessary enactment; but it should have been made long before 1888. Canal transport is of great value for many classes of building material and other heavy traffic; and it is certainly against the interests of trade, generally, for existing waterways to be allowed to fall into disuse.

WE have received from Messrs. Woodhouse & Willoughby, architects, of Manchester, a long correspondence on the subject of the competition for the Technical Institute for St. Helens, presented to that town by Colonel Gamble, and thence called the "Gamble Institute." The competition was decided in October of last year, with the assistance of Mr. Hartley, architect, of Liverpool, as assessor, and the first premium was awarded by him to Messrs. Woodhouse & Willoughby, the second to Messrs. Briggs & Wolstenholme of Blackburn, and the third to Mr. Ledger, of London. The committee paid the premiums in accordance with the assessor's judgment, but observed that all the designs sent in would entail a greater cost than the stipulated 20,000*l.*, and invited the three premiated competitors to consider the possibility of modifying their plans so as to reduce the cost. This appears to have been done, and in the sequel the committee preferred the second premiated design for execution. The architects of the first premiated design consider that a great wrong has been done to them, to the profession, and to the assessor. This is another of those cases in which there seems to be such a confusion of ideas as to the powers and position of the assessor. As we have already pointed out in regard to another case, an assessor is an adviser, not a supreme judge; and as we have repeatedly pointed out, it cannot be expected that those who are to pay for and use the building are to exercise no choice in the matter. In the present case it appears that the conditions of competition distinctly stated that "The committee reserve the right to carry out any of the designs sent in, whether premiated or not," those are the actual words; and of course in that case they are acting strictly within their rights. If architects wish it to be a condition that the assessor's judgment is to be final, why do they go into a competition in which it is distinctly stated that it will not necessarily be so? We really cannot see that the committee are to blame, as a matter of conduct; they reserved the right to erect whichever building they preferred, and they are so far following the assessor's advice that they are choosing the one he placed second. They have made a mistake, but since, as we also observed before, assessors are after all not infallible, it is within the bounds of possibility that they may be right in that respect too: we express no opinion on the point, as we have not seen either design. But architects ought really to remember that the people who pay for the building have some rights also.



THE Admiralty project for strengthening the defences of Portland Roads will involve, if fully accomplished, an expenditure estimated at nearly one million sterling. Messrs. Hill & Sons, of Southampton, take the contract, and the works will, it is anticipated, occupy ten years. The Government propose to first build a chain of piers or bastions in Weymouth Bay, to be connected by "booms" impassable by torpedo-boats, and ultimately to erect in the spaces between the piers a second breakwater, one mile and three-quarters long, to join with the present one, and thus to enclose the Roads. Under an Act of 1847 for the construction of harbours along our coast the existing breakwater was begun in 1849, one year after the completion of that at Plymouth, which Rennie began in 1811. The first engineer was J. M. Rendel; after his death its completion (1871) was entrusted to Sir John Hawkshaw and Sir John Coode. Lying north of the Shambles it consists of a shore end, beginning at the island, 1,700 ft. long; then comes a gap of 400 ft. for sea-way, and then a second portion curving to the north, 6,400 ft. long, and standing in a depth of from eight to ten fathoms at low water. Excepting the pier-heads, and the wall of the shore-end, which are of masonry, it is composed of two unpaved slopes of loose rubble, cast in from the island quarries, the island end carrying a plumb wall, which is founded at low-water level. Rendel is said to have first employed, in 1838, at Millbay, Plymouth, the method of laying *pierres perdues*, which he adopted on a large scale at Holyhead and Portland. The largest stones weighed from five to seven tons, and it is computed that 5,731,000 tons were used,\* at a cost of from 348*l.* to 360*l.* per lineal yard, or 1,034,000*l.* in all, convict labour having been utilised. The Moles at Tyre and Carthage, Venice, Genoa, and Rochelle were constructed upon a similar plan of dropping stones into the sea.

THE default by the Manchester, Sheffield, and Lincolnshire Railway in the payment of the interest on the preference stocks is of interest to others than the actual shareholders. This financial collapse renders it altogether improbable that the extension to London will be carried out for many years to come—if, indeed, it should ever be an accomplished fact. The idea is largely a personal one on the part of Sir Edward Watkin, and the scheme cannot be carried out in his life-time. It is, therefore, one which must be relegated to the dim and distant future. But, meanwhile, a large quantity of house property in the Marylebone district has been depreciated in consequence of the proposal to form a terminus in that locality, and as long as there is any possibility of Sir E. Watkin's scheme being carried out, it must influence property in that district. Moreover, the non-completion of the Sheffield Company's undertaking must adversely influence the prosperity of the Metropolitan Railway, and so the public will have to wait for improvements on that line, which are urgently needed. A struggling company cannot spend money except upon actual necessities.

IT is desirable that the case of *Briggs v. Lucas & Aird*, which came before the Queen's Bench Division last week, should not be passed over without some notice. It will make the public better appreciate the contest as to the clause to enable workmen to contract themselves out of the Employers' Liability Act. The action was brought against Messrs. Lucas & Aird by one of their workmen for damages for personal injuries received in the course of his employment, and it was originally tried in the County Court. The jury found that there

was no negligence on the part of the defendants, and judgment was therefore given against the plaintiff. The latter appealed, but the appeal was dismissed with costs. If the plaintiff had been in the employment, say, of Messrs. Armstrong & Co., and he had suffered injury, and, as is the case with the workmen of this firm, he had contracted out of the Act, he would have received a sum in respect of his injuries, even though there had been no negligence on the employers' part. True, the amount might have been less than that which he would have received from a jury had he been successful; but then he ran the risk of losing his case, and it is obviously better for a workman to be sure of moderate compensation in any event than of large compensation if negligence can be proved against his employers. Besides, if he goes to law and is unsuccessful he has to pay his own and the defendants' costs, and is, therefore, actually out of pocket by his litigation.

AN interesting discovery has recently been made in the Tannus Mountains (a few miles north of Frankfurt-on-Main) by the German Imperial Commission for the Investigation of Antiquities. It had been noticed some years ago that in those places where the Limes Trans-Rhenus (a wall of earth bordering on a moat) was changed in character so as to become similar to the Limes Rhaeticus (a stone wall without a moat) there was a small trench running alongside at a distance of about six yards from the wall. This was also found to be the case at Hunheim, in Bavaria, and in other places where, at Mommsen's instigation, a thorough examination had also been made of the Limes Rhaeticus. As a result of excavations in this trench, undertaken at the instance of Herr Jacobi, one of the Government Surveyors, what was evidently the original Roman frontier mark was met with at about 2 ft. below the surface. The frontier was delineated by a series of blocks of stone some distance apart from one another. Underneath these stones were found the various marks of the Roman surveyors. Elsewhere excavations showed that the frontier was marked by other means, such as black earth or wooden pegs.

WE have on several previous occasions referred to the proposed great National Industrial Exhibition at Berlin in 1896. Great progress has recently been made in the organisation of this exhibition, due in a great measure to the interest shown in the scheme by the Imperial Chancellor, Count Caprivi, and the President of the Ministerial Council, Count Eulenbarg. After a number of misunderstandings the Municipal Authorities have now appointed a committee to co-operate with the promoters of the Exhibition, whilst the German electrical engineers have done away with a great financial difficulty by deciding at their meeting at Cologne to supply all the light and power necessary as exhibits. Committees are already constituted for each of the twenty-three groups into which the exhibits have been divided, viz.:—

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| I. Textile Industries.                     | building and  |
| II. Clothing Trade.                        | Transport.  |
| III. Building and Engineering.             | XIV. Electrical Engineering.                              |
| IV. Wood-working.                          | XV. Leather and Gutta-percha Trades.                      |
| V. Porcelain, Marble, Glass, &c., working. | XVI. Paper Trade.   |
| VI. Dry Goods and Jewellery Trade.         | XVII. Photography.  |
| VII. Metal-working.                        | XVIII. Sanitation and Sanitary Trade.                     |
| VIII. Printing and allied Trades.          | XIX. Education.   |
| IX. Chemical Trade.                        | XX. Granting of Patents, Trade-marks, &c.                 |
| X. Means of Nourishment.                   | XXI. Fishing and Marine Industries, Sports, and Pastimes. |
| XI. Scientific Instruments.                | XXII. Licensed Victualling Trade.                         |
| XII. Musical Instruments.                  | XXIII. Horticulture.                                      |
| XIII. Construction of Machinery, Ship-     |   |

The guarantee fund already exceeds £50,000*l.*

and up to the present 3,300 intending exhibitors have applied for space, with every prospect of this number being greatly augmented in the near future. The site for the exhibition has not yet been decided on.

THE Bishop of London intends to issue a commission to consider the expediency of uniting the benefices of St. Michael Burleigh-street, and the Mission Church Bedfordbury, with that of St. Martin-in-the-Fields. Bedfordbury, built *circa* 1637, was once an important street; it yet retains two or three old houses, though several have been pulled down during the past fifteen years or so. The church, on the west side, and next to the Hop-gardens, was designed by Sir Arthur Blomfield, the organ being by Hobson, as we read in "Mackeson's Guide." St. Michael's was built in 1833, in the first Pointed style, with a tower and spire, from the plans and designs of Savage.\* The organ, by Gray, was restored by Richardson in 1871. Whilst Bedfordbury commemorates the adjacent town mansion of Francis, second Earl of Bedford, Burleigh-street represents that of his no less famed neighbour, Sir William Cecil, afterwards Lord High Treasurer. Cecil House had been built on the site, says Stow, of St. Martin's Parsonage-house and its close, by Sir Thomas Palmer, *temp.* Edward VI. On his attainder, & Mary, the property reverted to the Crown. Queen Elizabeth bestowed it upon Lord Burleigh, who enlarged the house, and there, on July 19, 1561, he entertained his sovereign. Nine years later he leased more ground from the Earl of Bedford. Norden describes it as—

A very fair house, raised with bricks, proportionately adorned with four turrets, placed on the four quarters of the house.

In Cecil House, which, as is commonly stated, remained until 1676, Evelyn was arrested, and for a while confined, for observing Christmas-day, 1657, "the superstitious time of the Nativity." It was the home of the first Earl of Shaftesbury, and the birthplace of his grandson, author of the "Characteristics." Having served during six years after the Great Fire for the Courts of Doctors' Commons, the house gave way to Barbon's Exeter Change, which projected into the Strand at the south end of the present Burleigh-street; and it is said that the two Corinthian columns drawn in G. Cooke's view, with other materials, belonged to the old building. In "Curiosities of London," edit. 1855, Timbs quotes J. H. Burn's statement that at the destruction of the Change in 1830 he saw cut in the stone architrave of the east window "Exeter Change 1670"—an earlier date by a few years than that generally given for its erection. They widened the Strand westwards to beyond Southampton-street. The later Exeter Change, a passage-way between Wellington-street and the Strand, where now stands the Gaiety Theatre, was removed thirty years ago.

IN an article on "bursting boilers" in the last number of the *Lancet* a mistaken statement is made that safety-valves are of no use against the sudden pressure caused by water entering a red-hot boiler. The writer of the remarks, which in general are sensible and to the point, says "A safety-valve will work in cases of gradually increasing pressure; but in the true form of burst boiler the pressure passes from nothing to infinity, if we may be allowed the little exaggeration, and any attempt at valve regulation would be futile." It is natural to think so, but experience has proved the contrary in well-attested cases. There are cases no doubt in which a safety-valve has not prevented the explosion, but it is very possible that in these cases the safety-valve had not been examined for some time, and was not in proper order. It is undesirable that the public should be told that safety-

\* On an average, one ton of Portland stone measures 15 cubic ft., so it has been calculated that each 20 cubic ft. of the Moles, including the interstices, contains one ton of rubble. (See L. F. Vernon-Harcourt's "Harbours and Docks," 1885.)

\* See Vol. viii. of T. Wright's continuation (1836) of Allen's "London."



valves are of no use to prevent the bursting of boilers, as they are thus encouraged to neglect a precaution which may and has prevented a serious and perhaps fatal accident. Safety-valves should be examined before each winter by a competent person, to see that they are in proper order; but they certainly should not be omitted.

WE give a short report in another column as to the new conveniences provided by the St. George's Vestry at Marble Arch, and just opened. We much regret to note that in this erection, otherwise an exceedingly good one, the penny-in-the-slot system has been adopted for opening the closets. After the correspondence in the *Times* some little time ago on the serious inconveniences of this system, which were so decisively proved that a large railway company altered all its closets after reading the correspondence (a most unusual concession to press influence on the part of a railway company), it is really stupid and discreditable for the Vestry of St. George, Hanover-square, to have adopted in a large public convenience at a crowded site, a system which has been so emphatically condemned by public experience.

WE are getting a little tired of hearing that the late Sir Andrew Clark said that work is good for everyone and gives more benefit than injury. We suppose that this is the opinion of most sensible people, but the distinction between work and overwork is not kept in view. Nor, what is equally important, is the necessity of doing work under healthy conditions sufficiently appreciated. We should have been glad if Sir Andrew Clark had emphasised the fact as well as that of the benefits of work. The community is not unmindful of this necessity in the case of artisans, as witness the recent inquiry into the condition of workmen in chemical works, but it is somewhat careless in the case of head-workers. There is much need for better ventilation and better sanitary arrangements in many offices, buildings, and shops of all sorts and sizes, and hundreds of cases of ill-health which are ascribed to overwork arise not from that cause but from work in unhealthy buildings, or even because the hours of leisure and sleep are not passed in properly-ventilated and properly-drained buildings. A man's eyes are intended for use, but they will not wear properly through a lifetime unless they are used in a proper light. The clerk who begins to find a failure of his eyesight puts it down to mere use: he forgets the glare of the gaslight which burns in the City throughout the winter above his head in the dark office in which he works. Let physicians preach the doctrine of work as much as they like, but let it be work in wholesome and well-lighted buildings.

#### THE LOAN EXHIBITION AT BURLINGTON HOUSE.

We have only space for a few brief notes on the contents of this year's Loan Exhibition, where we met some old friends, as well as new ones. In Gallery I. are two pictures which it is particularly interesting to see. Frederick Walker's "The Plough" (8), now the property of the Marquis de Misa, re-appears on the walls where not so many years ago it appeared as the work of one of the most remarkable of living artists. The picture is as striking now as it was then, and seems likely to hold the place originally predicted for it. Both in general feeling and in the treatment of landscape it is a very distinctly nineteenth-century picture; a landscape, one may say with a "moral tone" about it, never dreamed of by landscape painters till the present generation, to which Walker may be said to belong; and perhaps there is a kind of intensity about it which compares to some extent unfavourably with the calmer and more subdued works around it, but it has its own strong interest nevertheless. The other painting we referred to is Paul

Chalmers's "End of the Harvest" (3), a singularly beautiful evening landscape by a painter whose reputation is not of the widest. The same room contains another remarkable work of Walker's, "The Wayfarers" (44), in which the figure of the blind man is one of the finest and most pathetic things he (or anyone) ever painted; the figure of the boy in this picture, like that of the ploughman in "The Plough," seems to show a slightly exaggerated strain after intensity of character, nor is the boy's action in walking quite natural; but it is a memorable work nevertheless.

This first room contains several notable landscapes. We may contrast here Turner's early brown style in "The Trossachs" (10), with the glow and glory of his later style in "Monte Rosa" (25), a morning effect of sunlit mist wonderfully conveyed, and his occasional eccentricity in "Storm off the Forelands" (19), in which it is rather difficult to understand that we are meant to be looking at a stormy sea. In fact, the picture might mean almost anything. Turner painted the sea finely in his earlier days, though more knowledge of ships and of their ways on the water would have been good for him. In the large "Wreck of the *Minotaur*" in Gallery III. (135) the sea seems to be piled in impossible heaps just as the painter wanted it, and the way the raft and people lie on the top of the water is something wonderful and unheard of. The size of the wrecked ship is also a good deal exaggerated for the sake of effect. In Gallery I. is an unusually beautiful work of Richard Wilson's, "The Convent, Twilight" (30), with a very fine treatment of light and evening sky, and a strangely modern sentiment about the whole. Had Wilson painted oftener like this, instead of dissipating himself so much in conventional classic landscapes, he would have left a greater name. A large landscape by Collins, "The Harvest Shower" (37), is a fine composition and an admirable specimen of his school; a school in which composition was more thought of than colour, the scale of colour in fact being for the most part a totally artificial one adopted by the artist to keep nature in her proper place and make her subservient to his scheme. We have vastly advanced in the present day in our perceptions of light and colour in landscape; but there is a breadth and unity of treatment in such a work as this of Collins's which is not without its instructive influence. Not far from this we are surprised by a little gem of Mason's, which we do not remember to have seen before, "Young Anglers" (47), three small figures reflected in a stream.

Among the figure pictures in Gallery I. we have one of the best works of Phillip's, "The Early Career of Murillo" (11), a painting admirably grouped and fine in colour, but somehow impressing one as commonplace. One or two of the figures, the girl looking over the priest's shoulder at the picture for instance, with her vacant stare of surprise, show distinct character; but this is a sort of picture one can imagine being "specially engraved for the *Graphic*," or as a London Art Union "prize." Etty's "Pluto and Proserpine" (14) makes one unhappy, it is so impossible to take any interest in it now; yet as a piece of colour it is undoubtedly fine. But Etty redeems himself in Gallery III., where we meet with his "Sleeping Nymph and Satyrs" (100), which was at a former loan exhibition, we know not how many years ago, and which we then thought, and think still, by far the most remarkable thing Etty ever did: in fact it is so completely on a higher level than any other painting of his we know of, and has such a real "Old Master" kind of power about it, that one cannot understand why, if Etty were able to do anything like this, he should not have done it oftener, instead of repeating his affected figures of nude sirens and others with plaits of hair depending over their faces. The subject is very frankly Pagan certainly; too Pagan, probably, to those who look more at the subject than the painting; but it is a piece of Paganism that Rubens might have been proud of, and has certainly more artistic delicacy, if it has not all the force of Rubens. The large gallery contains, we must confess, a certain number of pictures which are interesting rather for the names they bear than for their qualities; but there are some works of the highest interest and beauty, quite enough in themselves to atone for any deficiencies in the remainder. Among these are Gainsborough's charming portrait of "Mrs. Thicknesse" (101); Vandeyck's splendid portrait of "Andrea Spinola, Doge of Genoa" (125), in his crimson robes; Reynolds's "Mrs. Jelf Powys and her Daughter

(128), and his still finer one of Lady Frances Marsham (136), representing as walking in a park—an ideal lady's portrait in its combined grace, freedom, and dignity of action. This has, we think, been at one of the early loan exhibitions, as also Gainsborough's excellent seated portrait of "Mrs. Wallace" (139) and her Pomeranian dog, in which one's admiration is pretty equally divided between the lady and the dog, in the matter of painting. A very interesting picture is that entitled "The Flute-player" (117), which the owner calls Giorgione, but which the Academy call Gian Girolamo Savoldo. Two large architectural paintings by Bellotto, views of Dresden (107 and 122), are exceptionally fine examples of the old school of hard and precise architectural painting.

The Dutch pictures of the year, collected as usual in Gallery II., are not of such interest as in many former exhibitions; but there are a few remarkable works. Among these is a wonderful little Rembrandt, "Shepherds and herdsman resting at night" (91) with an effect of moonlight over the top of a dark hill which is extraordinary, one can scarcely believe it is done by pigments. There are two or three good Jan Steens and a good Teniers; a large portrait by Rubens and another by Mierevelt; two good Cuyps (if Cuyps are good except in a relative sense) and some other works of more or less interest. The early Italian paintings are of more interest historically than artistically.

One room is devoted to a collection of Mr. Pettie's works, which bear very well the ordeal of collection, considering that the subjects are mostly not of very great interest in themselves—we should have been glad to see among them "The Traitor," certainly one of the best pictures he ever painted; we are glad to see "To the Death," (201), the duel with rapier and dagger, to our thinking quite his best picture, and a remarkable realisation of one of the social institutions of a former day. The manner in which the nervous tension of each of the combatants is expressed, the set of their feet on the ground so as to give the utmost grip for a spring forward or backward as may be required, is truly admirable. We have heard the criticism that there is too much canvas for the subject, but it must be remembered that the combatants in such a duel required plenty of space to jump about in; there would have been a feeling that they were cramped if less ground had been allowed them. Among the best of the other works are "Terms to the Besieged" (203), "The Sally" (207), and "Challenged" (208).

The exhibition of the works of Stothard, in the water-colour gallery, was one which it was right to make, but we fear it confirms in our mind the opinion we have formerly given expression to, that Stothard was a man greatly over-rated in his own day, and perhaps since, except in one sense, viz., as a book illustrator and sketcher of small scenes. The small sketches at the top of the room, for illustrations to "Clarissa Harlowe" and other works, are almost all charming, and the paintings show very often a very fine feeling for colour. But in proportion as Stothard finished more his defects of draughtsmanship became more apparent. His conception of a scene was often admirable, but spoiled in the working out. Among the paintings those which show him at his best are two or three pictures of a garden subject (a kind of Decameron scene) called "Sans Souci"; "Leaving Home" (205), in illustration of Goldsmith's "Deserted Village"; "Jacob's Dream" (266), a very charming conception; "The Children of Tippecanoe" (268). We wish his exquisite little "Fête Champêtre," with figures dancing under the dark shade of trees, had been here; it showed just what he could do best in painting. The Canterbury Pilgrims is of course a remarkable work in its way, though the horses are very bad; and the replica exhibited here is not the best edition of the painting. Among the drawings, besides the book illustrations, we may draw attention to the fine design of Boadicea (45), a pen and bistre drawing, and to the lovely little sketch of "Cupid and Campaspe" (36), a sort of thing that is like one of Herrick's best poems. Those who do not know Stothard's work of this kind should not omit to look at this collection of his drawings, which are well worth attention, however doubtful one may feel about his oil-paintings.

The small room, through the water-colour room, is occupied by a set of brush reproductions by Blake of his, in some respects, wonderful set of illustrations to the Book of Job. They are not nearly so impressive in this form, however, as in the engravings.



# THE ROYAL INSTITUTE OF BRITISH ARCHITECTS.

The sixth general meeting of the present session of the Royal Institute of British Architects was held on Monday last at Conduit-street, Mr. J. Macvicar Anderson, President, in the chair.

## Death of M. César Daly.

The President said it was with very sincere sorrow that he had to intimate that M. César Daly, Honorary Corresponding Member of the Institute, and Gold Medallist for 1892, died at the Institute, his residence in France, on the 10th inst. at the ripe age of 83. It was so recently and so fully that he (the President) had described his career and works in that room\* that it would be unnecessary to make further references to them; but he could not allow the occasion of the death of one whom they respected so much to pass without one or two references. On the occasion of presenting the Queen's Gold Medal to him some eighteen months since, he (the President) indulged in the hope that it might please God to spare for some years one whom they so much admired and respected. The hope had been only to some extent fulfilled. It seemed but yesterday since the dear old man stood there by his side. He delivered an address so full of youthful vigour, energy, and thoughtful inquiry, as to strike everyone who listened to it as being, for a man of his years, a very remarkable performance. He had now gone, but his example remained—a noble example, which he (the President) thought the members might all emulate, for it was an example of a life of constant work, ceaseless, indomitable, indefatigable energy, and of constant devotion to the interests of the art which he loved so dearly. He (the President) felt sure the members would pardon him for having tried to express in these few words what he felt, for he could not but regard the memory of César Daly—alas! that it should be but a memory now—alike with respect and affection.

## Some Aspects of the Mutual Relationship of Architects.

The President then delivered the following address to students entitled "Some Aspects of the Mutual Relationship of Architects":—"On the first occasion on which it was my privilege to address you I directed your attention to the consideration of what is probably the most important subject to which an architect can devote his studies—the art of planning; for on the successful development of that art depends the daily comfort, convenience, and, therefore, to a great extent the happiness, of the community. Hence it is impossible to overrate the crucial importance of the subject, or to impress it too strongly on the minds of those who, as students, are about to embark on their career as architects. The mistaken idea that such work as planning is not art has led many, who should have known better, to derogate it to a position of comparatively minor importance. He who regards planning as inartistic or unimportant has no claim to be a true architect. When addressing you last year I offered some suggestions in reference to the varied and extensive responsibilities which you will, as architects, be called on to discharge to clients, contractors, artists, tradesmen, and others. I propose now to confine what will be my final words to you from this chair, to one other position which you will occupy—your relationship to the members of your own profession, a relationship second to none in interest, for surely no right-thinking architect can disregard the advantage of possessing the good opinion of his professional brethren in respect alike of his works and of his character.

## Master and Pupil.

Let me first touch on the preliminary aspect of this question—the relationship between master and pupil, of which some of you probably have already had experience. Notwithstanding the remarkable expansion of educational facilities in recent years, I suppose the old-fashioned system of pupillage which prevails in this country not only holds its own, but is likely to find increasing favour. In days gone by, when educational facilities—other than those which were to be casually picked up in an office—did not exist, it was perhaps not unnatural that the system of pupillage should be liable to abuse, because the only, or nearly the only, means of acquiring knowledge was from such information as the master might choose to impart. Hence the pupil was to a large extent, if not solely, dependent on the master, and in such circumstances a niggard

spirit of exaction on either side would surely conduce to a relationship the reverse of satisfactory. In these later days this is not likely to occur, for the pupil is not now solely dependent on his master for the acquisition of knowledge. The air is full of educational courses, curricula, syllabi, lectures, and classes, and the remarkable success which many of these have attained demonstrates how much they were needed. The creation and continuing elaboration of such educational facilities has materially altered the relations which formerly existed between master and pupil. It is true that students must to some extent take advantage of such facilities after office hours; but I think that, in receiving a pupil and accepting a premium with him, a master is now bound, not merely to extend to him the advantages of training in his office, but, in addition, to recognise the existence of educational institutions outside, and to afford to his pupils reasonable facilities for profiting by them. And if this be so, what is the corresponding claim on the pupil? Obviously that, in enjoying the privilege of opportunities of study apart from the office, he is bound to devote himself with all the keener application to the work of the office while in it. No office can be properly conducted without discipline. Regularity, application, system, are indispensable. If, in an enlightened and liberal spirit, hours are set apart in which pupils can engage in outside study, they should be rigidly and loyally adhered to. To fail in this is not merely loss to the individual, but injury to others, for the force of example is great, and no one can release himself, even thus early in life, from exercising influence on others; it may be for good, it may be for evil, but it must be for one or other.

One valuable branch of study outside the office, for engaging in which a master should always be glad to afford his pupils facilities, is that of sketching and measuring old buildings. To anyone possessing the gift of artistic draughtsmanship this is an enchanting occupation, although not free from a seductive, and even dangerous, tendency. To make pretty sketches, however fascinating, is not the object in view. Far be it from me to detract from the charm of artistic sketches, but what I insist on is that in sketches of old work the primary requirements are accuracy and clearness, lines well defined, forms and proportions true, joints and construction expressed, and dimensions clearly figured. Such sketches should be finished on the spot, and should not be touched up afterwards. By such subsequent treatment they may lose some of their charm, and must lose much of their value, for, if not finished at the time, they cannot be guaranteed as accurate delineations. That this subject is rightly regarded as of great importance is illustrated by the prizes offered here and elsewhere for measured drawings and sketches; and while, as I have said, masters should always afford facilities, pupils should never lose opportunities for engaging in it. The eye as well as the hand is thus trained to accuracy, and the mind is stored with useful knowledge. In view of the value attaching to work of this nature, I have thought that it would not be uninteresting or unprofitable to direct your attention to the measured sketches of an old master in architecture and his pupils, one whose memory—though he has long since passed away—still lives, and is likely to survive the changing fashions of succeeding eras. Palladio, as you all know, lived in the sixteenth century, having been born in 1518, and having died in 1580. The sketches exhibited, as illustrative of the manner of such work at the period referred to, form part of the Burlington-Devonshire collection, which, through the munificence of our Honorary Fellow, the present Duke of Devonshire, have now become, under certain conditions, the property of the Royal Institute of British Architects. They are interesting as illustrating the actual manner of work of an eminent architect of the sixteenth century and his assistants, a period when architectural students did not glory in the manifold advantages which they enjoy in the present day. It is to be noted, too, that, apart from the character of the draughtsmanship, these sketches amply fulfilled their proper purpose, inasmuch as complete drawings of the buildings they represent—the Baths of Agrippa and of Caracalla—were afterwards made from them, and published in the great Earl of Burlington's book,\* which you will find in the library. In further illustration of the manner of work of such masters, a selection from the

drawings of the followers of the Palladian school in our own country—Inigo Jones, John Webb, and others in the seventeenth century, and of William Kent in the eighteenth—some of which are signed, is also exhibited; and in respect both of draughtsmanship and design, they may, in my humble judgment, be profitably studied by students, and, I venture to add, even by the architects of this privileged age.

## Architectural Competitions.

Passing from such early relationship of master and pupil to more mature experience, many of you will, no doubt, find yourselves occupying the position of friendly rivals in architectural competitions. The general question of whether the system of competition is advantageous or prejudicial to the interests of architecture need not now be discussed. I have more than once recorded an opinion unfavourable to the system, and I see no reason to alter it. I fear, however, that, whether we like the competitive system or not, we must accept it as an established fact, and as practical men, therefore, our efforts should be directed to mitigating its evils, as I should say—or emphasising its advantages, as others may think. There can be no doubt that much has already been accomplished in this direction by the Royal Institute. I have observed that the paper of "Suggestions for the Conduct of Architectural Competitions" which we publish, is very generally referred to and adopted by promoters of competitions throughout the country, and I cannot but recognise that—in spite of occasional enormities—there is now a more general desire to treat architects well than was formerly the case. In my experience as assessor, I have happily succeeded, in more than one instance, in prevailing on promoters to recast conditions, which had already been drawn up although not issued, in such a way as to expunge all objectionable features, and to make them perfectly fair and satisfactory. It is gratifying to be able to record the growth of such a spirit of equity and liberality on the part of promoters as has rendered this possible. In some cases, however, conditions are drawn and issued before the assessor is consulted—as, for example, in the recent competition for the extension of the Pump-Room at Bath. When this is the case, all the assessor can do is to select the best designs in conformity with the conditions, apart from the question of their excellence or otherwise. I confidently assert that in every such instance which has come under my own cognisance, the promoters have suffered from not having called in a professional expert to advise them from the outset.

The question whether promoters should be bound to adopt the award of their assessor is one which admits of a good deal of discussion. It is argued on one side that it is only human nature for those who are going to spend money on the proposed building to reserve to themselves the right of ultimate selection; while, on the other hand, it is asked, What is the use of taking professional advice unless it is adopted? In regard to the first, it should be borne in mind that in almost every competition the promoters do not spend their own money, but that of ratepayers or subscribers, and that they consequently are only agents between the capitalist and the profession; while, in regard to the other view, it does not seem to me to be a *sequitur*, however desirable, that because you call in professional advice you are bound to act on it. I confess, however, that my sympathies are all in favour of unreserved powers being conferred on the assessor. If it is desirable to secure expert skill in the preparation of the competitive designs, is it not equally so in regard to their selection? At all events, I am satisfied that an assessor, when consulted as to the conditions, should allow no mistaken feeling of delicacy to deter him from securing, if possible, the ultimate decision for himself, on the ground that nothing will tend more to inspire confidence in competitors than the insertion of such a condition. He cannot, of course, insist on this, but if he exercises ordinary tact I am convinced that in nine cases out of ten he will succeed. Such has been my own experience, for in more than one case I have obtained this concession contrary to the expressed desire of promoters. Whatever may be thought, however, as to the respective rights of promoters in this respect, there can be no manner of doubt that the interests of architecture are best promoted when the final decision is left unrestrictedly in the hands of the professional assessor. An apt illustration of this is the recent Pump-Room competition at Bath, already referred to. The promoters reserved to themselves the ultimate selection, and in the exercise of this right adopted

\* "Fabbriche Antiche disegnate da Andrea Palladio Vicentino e date in luce da Riccardo Conte di Burlington." Fo. Lond., 1733.

† See *Builder* for July 7, 1893.



the design which Mr. Waterhouse had placed second in preference to the design to which he awarded the first premium. In view of the sequel, how infinitely better would it have been for themselves and all concerned had they adopted the award of Mr. Waterhouse! I did what I could to press this view upon them, but ineffectually. A unique feature in this competition—and one which I trust may remain so—was the circumstance that the competitor who was placed second by Mr. Waterhouse, and whom the promoters determined to place first, turned out to be an official of their own who had himself drawn up the conditions. One can scarcely conceive a greater act of impropriety, or one more absolutely unfair to other competitors, and yet a proposition was actually made to the effect that a second competition should be instituted between the three competitors selected by Mr. Waterhouse, one of whom was the official in question. My advice was sought in regard to this proposition before it was brought forward, and it was given unhesitatingly to the effect that there was only one course to pursue—namely, to adopt Mr. Waterhouse's award in respect of the design he placed first, to disqualify the second, to give the second place to the design he placed third, and to ask him to select a design to take the place of the latter; further, that in any circumstances the offence of the official in question was so grave that he should be absolutely precluded from having any further connexion with the matter.

Another illustration of the advantage of the decision of the assessor being final occurred recently. The conditions had been issued and the designs received before I was consulted. While leaving my judgment free—for otherwise I would not, of course, have accepted the appointment—the promoters requested me to consider the designs in a recommended order of merit. It so happened that as regards such order the first had to be last, and the last first, or nearly so, for the design which was far and away the best in every respect, and which I accordingly placed first, was last but one, and the one which beyond comparison was the least meritorious occupied the first place in the suggested order of merit! It is satisfactory, however, to add that the promoters appreciated the reasons which I put before them for my selection, and at once adopted my award.

The relation which competitors bear to one another is, or should be, so simple and clear as not to require definition, and yet a recent instance demonstrates that this is not necessarily the case. We expect, and rightly expect, fair dealing on the part of promoters; and they and we have the same right—neither more nor less—to expect fair dealing on the part of competitors. The unmistakable course for competitors to follow is to comply strictly with the spirit and the letter of the instructions. When conditions are properly drawn, there should be neither doubt nor difficulty in doing so. Such obvious procedure was singularly disregarded in the case of a competition held not many months since. The conditions were evidently drawn with the intention of precluding any chance of the identity of competitors being disclosed, and yet I regret to state that an architect, who at the time was a member of one of our allied societies and an Associate of the Institute, did not scruple to contravene the conditions by disclosing his identity—not, it is true, by signing his drawings, which would have been mainly, though perhaps quixotic in view of the conditions—but by means which we could not but condemn, and which were indignantly disowned by his provincial brethren. I need scarcely add that the architect in question is no longer an Associate of the Institute, nor a member of the allied society: so far, well; but the pity is that the credit of the profession should have been even temporarily tarnished by such conduct on the part of one of its members.

#### Criticism.

Those of you who possess literary ability may sometimes find yourselves placed in positions of delicacy and difficulty in relation to your professional brethren. A facile pen is an acquisition greatly to be desired when guided by truth, knowledge, and charity; it becomes a dangerous power when influenced by prejudice, envy, or ambition. Nothing is more easy for one possessing this power than to write sharp philippics which will insure an approving laugh from the unthinking—but what of the keen wound they may inflict on some sensitive nature? Nothing is so easy as to write disparaging criticisms—for the discovery of real merit calls for study—but what if they are wide of the mark and suggest misleading conclusions? No one

should venture to criticise the work of others without first honestly trying to place himself in the position of the author of the work criticised, and to realise the difficulties he had to contend with. Viewed from a general standpoint, a work may be severely censured, which, regarded in the light of the circumstances in which it was conceived, may rightly be accepted as a triumph. This is specially true as regards architectural criticism. How often do our critics and reviewers strive to realise and to make allowance for the difficulties and the hindrances which surrounded the inception or the execution of the work criticised? How often do such considerations influence the pens of ready writers? Alas, for the rarity of Christian charity! It is to be feared that the literary reputation of the critic is too often the influencing motive, regardless of the feelings of the author, and of the difficulties he had to contend with. Be assured your criticism of the work of others will be none the less pungent, and will be all the more appreciated, if your pen is divorced from prejudice and thoughtlessness, and inspired by truth and knowledge, seasoned with brotherly kindness.

#### Witnesses.

You may be called on to aid by your testimony as experts in influencing judgment for or against your contemporaries. It has ever been—and I suppose it ever will be—the case that men will differ. Even the highest code of morality anticipated this in the qualified injunction, "If it be possible, as much as lieth in you, live peaceably with all men." No doubt there are some to whom the injunction does not apply, inasmuch as to live at peace with anyone seems to be with them a sheer impossibility; but even with those who are peaceably disposed, circumstances will occasionally arise, involving a principle which they cannot concede, and which render it necessary to appeal to the help of others either in law or in arbitration. I cannot claim to speak on this subject as an expert, my appearance in courts of law having happily—although unfortunately, too—been restricted to the discharge of the wearisome duties of a jurymen; but it has sometimes vexed me to hear some of my professional brethren, whom I knew to be men of probity, censured by others for appearing as witnesses and giving testimony against them. Such experiences, which are by no means restricted to the profession of architects, may be thought to be unedifying, and I confess that I regard the relationship as perhaps the least desirable, and the most inartistic, which an architect can occupy; but yet I fail to see why the witness should be the subject of censure more than he against whom he testifieth. Is it not the fact that the last-named is frequently the original sinner? How can light be thrown on a purely technical point other than by the evidence of experts? and how can such evidence be obtained if none will appear as witnesses? How can questionable or derogatory proceedings be exposed if reputable men will not come forward to testify against them? Further, why should it be thought strange that men of the same craft should differ in the witness-box, so long as it is a patent fact that in scarcely any topic of ordinary conversation in society will the same view be taken? In this relationship the rule of guidance appears to me to be clear and simple. Do not consent to give evidence as to the works or character of a brother architect unless you are perfectly sure that you can testify from the safe basis of experience, and in the honest belief that what you testify is truth.

#### Etiquette.

No dissertation on the relationship in which professional men stand to each other would be complete without some reference to the subject of professional etiquette. We have heard etiquette condemned. We have been told of the triumph of prejudice and jealousy to the detriment of the welfare of client or patient. We have even heard whispers of the neglect of patients rather than the consultation with the rival practitioner which might have saved life. Such rumours—if, indeed, they are true—are at best but exaggerated indications of exceptions which prove the rule. Etiquette gives honour where honour is due; it rightly exposes impostors. Etiquette appreciates ability and encourages merit; it scathingly condemns the individual and the society that live on borrowed plumes, assuming virtue if they have it not. Etiquette generously extends the arm of sympathy; it would rather cut off the right hand than by word or deed injure others for the sake of personal aggrandisement. Etiquette recognises all honourable methods of advancement; it

rightly looks askance at questionable expedients of self-advertisement, such as are too frequently resorted to. In a word, etiquette is the standard which unerringly gauges the reputation of professional men; above the level of the gauge is to be found all that is honourable and commendable; beneath it, all that is grovelling and unworthy. In the Harveian oration delivered at the Royal College of Physicians last October by Dr. Pye Smith, this subject was so happily delineated that I cannot refrain from quoting the words of the Harveian orator:—"Professional etiquette really means the observance of those rules which distinguish a profession from a trade, which make our calling honourable as well as honest, which check the arts of advertisement and direct our ambition to obtaining the suffrages—not of the public which cannot, but of our profession which can—judge truly, rules of conduct which are, in fact, nothing but the carrying into daily practice of the golden rule, to do to others as we would they should do to us."

#### Sir Frederic Leighton's Addresses.

Although my subject is the relationship that exists between members of our own profession, I must, before closing, crave your indulgence, while, for one moment, I stray beyond it, for the purpose of directing your particular attention as students of Architecture, to the very remarkable addresses on the arts, and more especially the architecture of different countries, which have been recently delivered by one who is not a member of our profession. For many years we have been accustomed to regard Sir Frederic Leighton as a man of great parts and exceptional culture. To refer to his works as a painter would be superfluous; his claim to be a sculptor of no mean order is indisputable; and as if this were not sufficient, the subject of his more recent addresses to the Students of the Royal Academy has led him, as it were inadvertently, to demonstrate that in regard to the art of architecture he possesses an intelligent and a critical grasp of the subject second to no modern author. To few indeed is it given to combine with wide historical research and keen critical acumen, the indescribable literary charm of composing poetry in prose. Let me commend to your thoughtful attention the study of these singularly learned and graceful discourses.

In now uttering my parting words to you from this chair, let me wish you God-speed in the elevating career on which you are entering, a career which is the unique embodiment of the ideal and the useful. In the pursuit of it you will not, it is true, be enfranchised from those hindrances, anxieties, and worries which are incidental to all human engagements; nor will you have as your goal the accumulation of wealth, which so many regard as the chief end of man, though it is far, very far, from being so in truth; but, if inspired by a generous spirit of devotion, such as should ever be the characteristic of the student of art, you will not fail to find in it as much pure enjoyment, and as much ennobling aspiration, as you are likely to attain in any avocation in which you could engage.

#### Review of Students' Work.

Mr. Alexander Graham, the member who had been deputed this year to prepare the usual critical notes on the students' drawings, then read a short series of notes on these, classifying them under the heads of:—(I.) Measured Drawings and Sketches; (II.) Original Designs; (III.) Literary work in the form of Essays; (IV.) The work of the Travelling Students of last year. In the course of his remarks he observed, in regard to the measured drawings and sketches, that it was matter of regret that the Institute Medal given for so important a branch of study as measured work should have attracted only two competitors, whereas the Pugin Studentship had enlisted the artistic services of six candidates of more than average ability. Sketching was a fascinating pastime for anyone who could use a pencil or a brush with ordinary facility, but pretty sketches, simply as little pictures, had no practical value, nor would they help an architect in his daily practice. A few careful measurements of any portion of a well-designed building, showing the size and jointing of the masonry as well as its scale and surroundings, committed to paper on plan, section, and elevation, would prove more instructive and more useful than whole sheets of pictorial bits.

As drawings of measured work nothing could be better than those of the north transept of Lincoln Cathedral, submitted by Mr. James R. Wigfull to whom the medal had been awarded:



Lincoln, with its charms of line and form and proportion, was always attractive to the student as well as to the advanced architect, and although nearly every part of the structure which was worth sketching or measuring had been committed to paper in recent years, such drawings as these were very welcome as a valuable contribution to the portfolios of the Institute. They were exactly what measured drawings should be: clear, precise, full of meaning, and without any attempt to produce pictorial or meretricious effect. He suggested that the measured drawings for which prizes had been awarded should be turned to more useful account than had hitherto been the custom. For nearly fifty years the holders of the Silver Medal had deposited in the library a copy or reproduction of their drawings, and, consequently, there was a mass of useful material stowed away which was accessible, but not easily so. Would it not be well, therefore, to classify this good material and to adopt, for the future, some uniform system of reproduction?

The large number of sketches submitted by six competitors for the Pugin Studentship indicated that the power of sketching with facility was spreading rapidly, but it was a question whether the excellent sketches of Mr. J. Paul Cooper, principally illustrative of Gothic architecture in Italy, were admissible for a prize awarded "for the promotion of the study of the Mediæval architecture of Great Britain and Ireland."

These remarks were in some way applicable also to Mr. W. Curtis Green's careful drawings of "Ye Old Oak House," West Bromwich, which might be classed as Mediæval, though some of the details give indications of work of later date.

The much-coveted prize of the Soane Medallion had been awarded to Mr. James Humphreys Tonge for a clever and picturesque design and accompanied by a fairly workable plan, but it was puzzling to know what could have induced so capable a designer to carry cross walls right through the centres of a series of bay-windows. These bays, which were conspicuous features in the quadrangle, were designed externally as one window and not as two separate windows. Another defect in the planning was the position of the water-closets, which were grouped together close to the main entrance gateway, and were accessible only by passing in front of a sitting-room window. It might be some consolation to Mr. R. S. Dodds, the author of "Quien Sabe," to know that his general design found almost as much favour with the judges as the one placed first. Its quiet collegiate character, the marked exercise of restraint in the treatment of wall surfaces, and the excellent proportions of the gateway-tower, were the most noticeable points in the design.

The Tite Prize had only attracted four competitors. So fascinating a subject as a Royal Mausoleum, to be treated according to the principles of Palladio, Vignola, Inigo Jones, or Wren, might have brought a larger number of candidates into the field. No one of the designs had attained such excellence as to evoke unqualified admiration, the merit lying almost as much in the plan as in any special skill in architectural composition. The prize had been awarded to Mr. A. R. Hennell, for a simple design after the manner of Palladio. The plan was meritorious, and the internal effect of the four bays with their domical roofs could not fail to be pleasing. The perspective drawing did scant justice to the design, and it was fortunate for the author that the merits of the composition and not the perspective had full weight with the adjudicating committee. The design bearing the device of a Red Cross was picturesque, but the architecture did not belong to any particular school. The general conception of the plan was meritorious, but it was doubtful whether an arrangement applicable to so large a building as the Invalides was suitable for an edifice of such very moderate dimensions. It was matter of surprise that none of the candidates were inspired by Bramante's charming little circular chapel of San Pietro in Montorio, which seemed to lend itself to such a subject as a Royal Mausoleum. It possesses many of the characteristics of the school of Vignola; and, for subtle proportions, balance of parts, and pleasing outline had not been surpassed by any other work of his kind.

For the Grissell Medal there was only one competitor. This was a matter of regret, for the subject, a timber dome with a lantern, was within the scope of any man who had had a moderate share of practical experience. The result was not altogether satisfactory, for the drawings exhibited were incomplete in themselves, and the subject, although commenced on right lines, had evidently not been fully worked out. It was to be hoped that

the same subject, or a similar one, would be given again, and that the author of this design would not be discouraged, but exercise his powers again with more fortunate results.

In regard to the literary work in the form of essays, Mr. Graham observed there seemed to be an idea that illustrations, mostly in the form of photographs, were the backbone of the composition, and that so many pages of descriptive matter, supplemented by a few comments, constituted an essay. Without any desire to undervalue the zeal and labour that had been shown in a marked degree by so many competitors, he would only venture to suggest the study of the pages of some of our great essay-writers, in order to learn from them the form and method adopted in building up their work, as it were, from the starting point. Mr. Graham concluded by speaking in high terms of the drawings by the Travelling Students of last year, noting, in particular, the valuable labours of Mr. Banister F. Fletcher, the holder of the Godwin Bursary. As a practical study of a notable group of temporary buildings, the handsome well-illustrated volume "Report on the Columbian Exposition at Chicago, 1893," would take honourable rank as a work of reference.

The President said it was never a very gracious task to criticise the work of others, especially of young men. Mr. Graham had happily found a great deal to commend in the work of this year, and if he had occasionally criticised freely faults, as he thought, in the works of the students, he was quite sure there was no young man so devoid of that common sense as not to be gratified by the friendly criticism of so experienced a critic as Mr. Graham. He thought, therefore, the members would all join with him heartily when he proposed a vote of thanks to Mr. Graham for his kindness in giving so much time to the preparation of these friendly criticisms.

Mr. Spiers also proposed a vote of thanks to the President for his excellent and admirable address, which, he said, would be of the greatest value, not only to the students present, but to the architects in the United Kingdom.

The President then proceeded to distribute the prizes to the successful competitors, whose names we published last week (see p. 33).

The President intimated that at the next meeting, which would be held on the 29th inst., a paper would be read by Professor Kerr, entitled "Observations on the Plans of Dwelling-houses in Towns."

The meeting then terminated.

#### ASSOCIATION OF MUNICIPAL AND COUNTY ENGINEERS.

A METROPOLITAN district meeting of the Association of Municipal and County Engineers was held at the Institution of Civil Engineers, Westminster, on the 12th inst. Mr. J. T. Eayrs (President of the Association) presided, and amongst a large attendance of members were Professor Robinson, Major Isaacs (Holborn), Messrs. T. de Courcy Meade (Hornsey), H. Percy Boulnois (Liverpool), C. H. Cooper (Wimbledon), C. Mason (St. Martin's), W. N. Blair (St. Pancras), R. Godfrey (King's Norton), Wheeler (Westminster), J. H. Strachan, C. Jones (Ealing), M. W. Jameson, J. Birch, F. J. C. May, F. W. Ruck, S. T. Tomkins, W. Forster, W. H. Savage, and others.

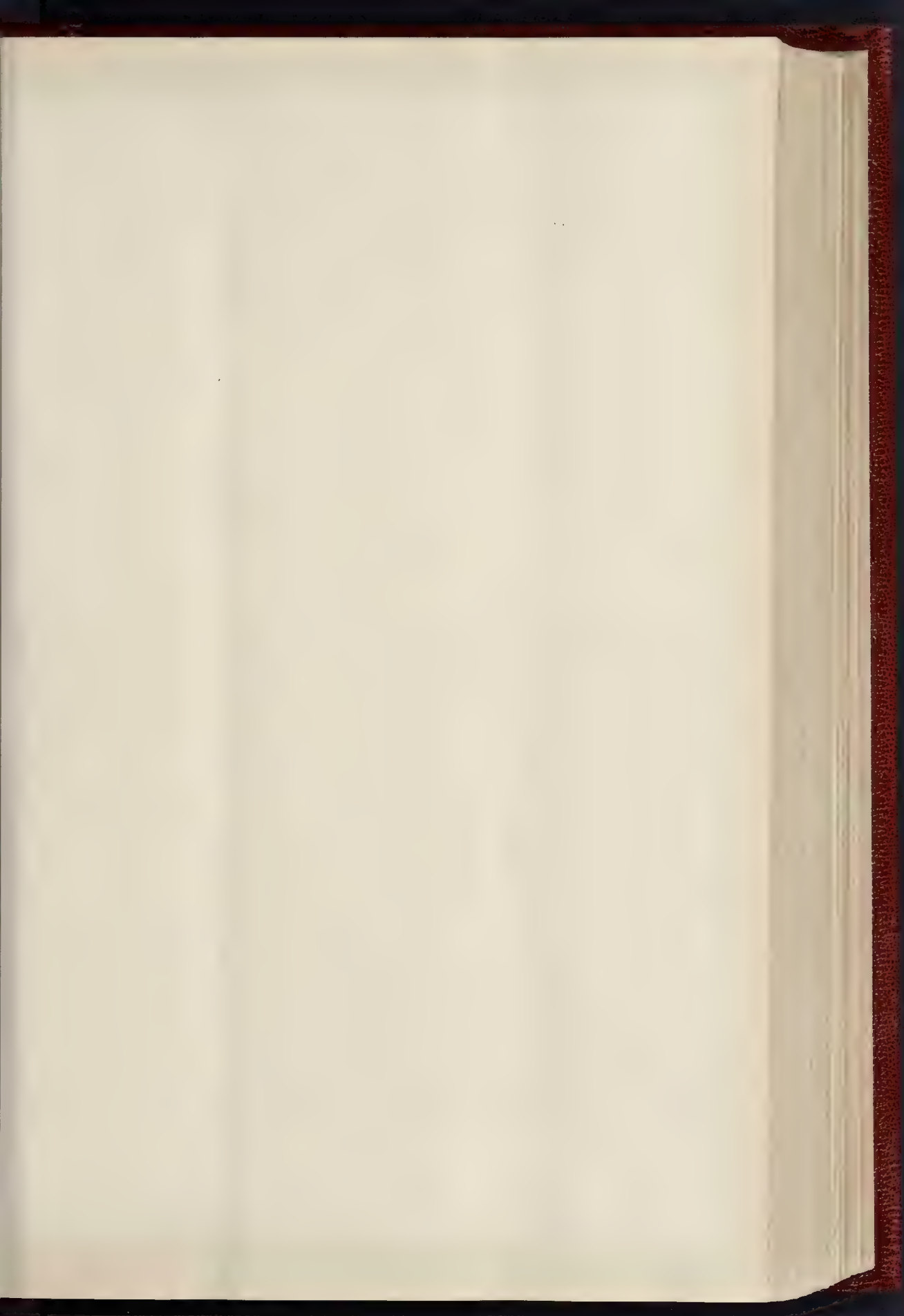
The President, in opening the meeting, wished the members a happy New Year, and expressed the hope that it would be a successful one, both to themselves and to the Association.

Mr. C. Mason then read a paper on Carriage-way Pavements, with special reference to what has recently been done in the Strand and Long Acre. He said that prior to 1883 most of the carriageways in the parish of St. Martin-in-the-Fields were paved with granite or macadam, but since that time the principal thoroughfares had been paved with yellow deal blocks, 9 in. by 3 in. by 6 in., creosoted and uncreosoted, laid upon a cement concrete foundation 6 in. in thickness, the blocks having 3-in. joints grouted in various ways, the work being done by contract. The carriageways of St. Martin's-lane, and Trafalgar-square (east) now existing, were part of the 1883 works, and are examples of wood pavement, having lasted ten years in the centre of London. In the years 1890-1-2, plain yellow deal blocks were used in all cases of renewal, the author's reason for using such materials being that he considered the traffic of the district to be so heavy that very little gain in the life of the road would be obtained by using

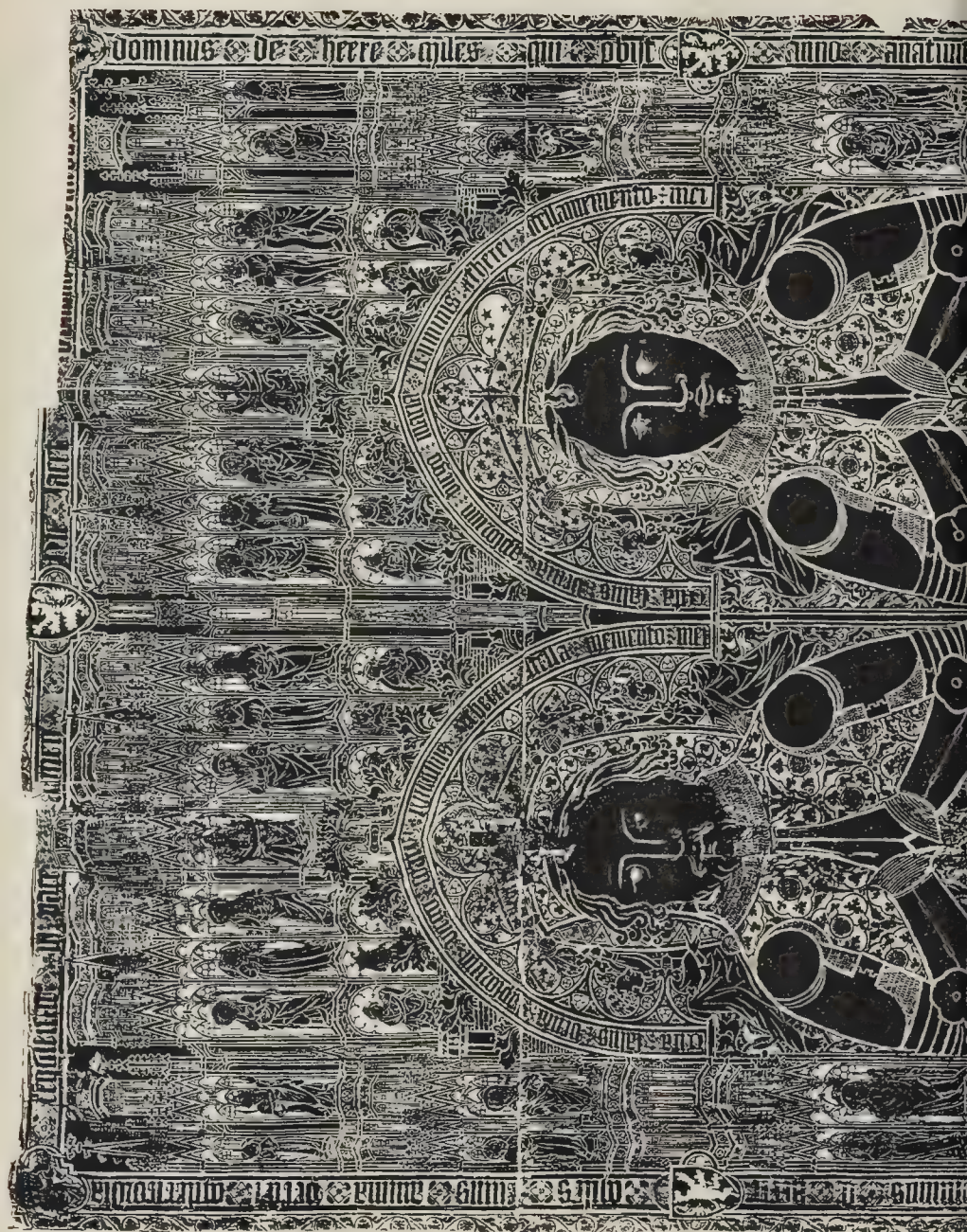
creosoted blocks, and he is still of opinion that creosoting does not materially increase the life of the pavement when subjected to an exceptional traffic, although he has recently advocated, and is now using creosoted blocks for sanitary reasons, and as being a better pavement for scavenging purposes, as the blocks dry more quickly than plain ones. In 1890 the repaving of Pall Mall East was carried out with blocks laid close together without any transverse joint, grouted with Portland cement; but as this was somewhat of an experiment an allowance was made for expansion in addition to the ordinary channel joints. It has since been proved that these joints were unnecessary, the wood not having expanded to any appreciable extent longitudinally. The wood paving in Northumberland-street was laid in a similar manner, but without the sand joints, and has been found to be a great success, so much so, that in the following year (1891) the granite pitching in the lower part of Villiers-street was taken up and the substituted wood pavement laid "close-jointed." In the same year the author had about two thousand yellow deal blocks treated with the preparation known as "Carbolinum Avenarius," which is largely used by railway companies for preserving sleepers.

The trial was considered satisfactory, and the author has had 30,000 more blocks similarly treated. The cost of treatment is about the same as creosote. The chief paving works of last year were in the Strand, Long Acre, Charing Cross, and Cranbourne-street. The pavement taken up in the Strand was laid in September, 1889, and was laid with plain yellow deals, with a short length of forty yards with "Jarrah" blocks. It was found that in four years the deal blocks had worn down to an average of 2½ in. in thickness in the narrower parts, and to an average of 3½ in. in the wider parts of the road. The Jarrah wood had been reduced to an average of 4 in. in depth, thus losing 1 in. as against 2½ in. for the deal blocks. This can hardly, however, be taken as an accurate test of the relative wear of the two materials, as the Jarrah was laid upon an unsatisfactory foundation. Immediately opposite the West Strand Post Office, adjoining Charing Cross, and at the starting-place for omnibuses going eastward, 6 in. deal blocks, laid in 1889, had worn practically through in twelve months. This portion was taken up in September, 1890, and repaved with 5 in. Jarrah blocks. This hard wood when taken up last September had worn down to a thickness of 2½ in. in the line of traffic. This may be taken as a fair illustration of the comparative life of the hard and soft woods when subject to an extraordinary wear and tear, the deal having worn 4½ in. in twelve months, as against the hard wood 2½ in. in thirty-six months, being in the ratio of 1 to 5. In April last year the author reported to the Vestry in favour of repaving the Strand during the autumn, and the question of material was discussed at several meetings, the main point being hard v. soft wood. The final decision of the Vestry was in favour of deal blocks, mainly in consequence of the hard wood being, in their opinion, too noisy a pavement and also liable to become more slippery than the softer material. There may be an objection in such a busy thoroughfare to any increase in the noise of the traffic, but it is still a matter of opinion as to whether the hard wood is more slippery if properly cleansed, and statistics on this point would be of value. The author having given statistics of the traffic in the Strand, the total number of vehicles passing Wellington-street in April 1890, in the period of eighteen hours, being 14,924, and details of the recent work of repaving the Strand, said he had little doubt that, by substituting hard for soft wood pavements, many of the difficulties now experienced would be overcome, a cleaner and more sanitary pavement would be obtained, and the cost of periodical renewals very much reduced.

Mr. W. N. Blair, A.M. Inst. C.E. (St. Pancras), then read a paper on the "Jointing of Wood Pavements." He said that, while the subject of carriage-way pavements had received considerable attention during the last few years, and various details in relation to materials and contour or profile had been gone into very thoroughly, there did not seem to have been the same interest displayed in securing a pavement comprising in as high a degree as possible the qualities of a durability, silence, facility for cleansing, and, as a consequence, economy. The questions to be considered in the paper were—(1) Is it desirable to have wood blocks in actual contact with each other on all sides? or (2) is it preferable to leave a space between the blocks to be filled up with some









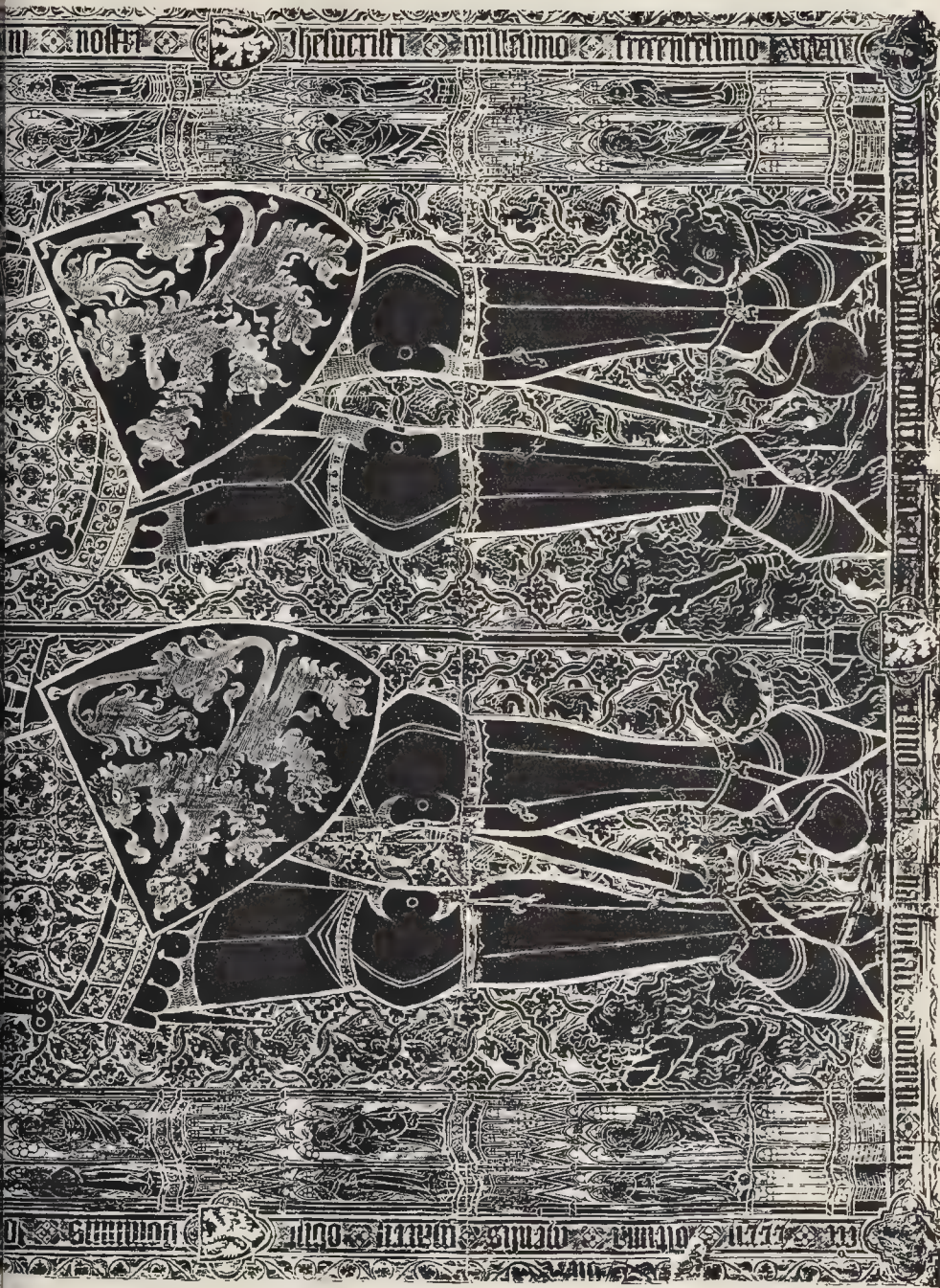


PHOTO L'YVO SPALUKE & CO. 4-5 EAST NINTH STREET, NEW YORK, N.Y.

BRASS OF THE DE HEERS, IN THE MUSÉE D'ANTIQUITÉS, BRUSSELS.—FROM A RUBBING TAKEN BY THE REV. E. TENNYSON D'E. JESSE.





her material? (3) what should that material be? (4) of what width should such spaces be? (5) with reference to joints, the author said it was admitted that all hands that an open or wide joint greatly reduces the life of the wood, as the fibre is allowed to spread, and disintegration follows. This defect is a matter of degree—the wider the joint the greater the injury—and with no joint at all the defect is eliminated; but Mr. Blair was of opinion that a joint of  $\frac{1}{4}$  in. or  $\frac{1}{8}$  in. does not cause any appreciable injury to the wood, and is filled with pitch, which is not subject to decay, and is covered by cement grout by being covered by traffic. It is also generally recognised that joints foster dirt, and dirt causes danger to traffic as well as discomfort to those who pass along or live in the street, and further, joints induce noise. The system adopted in the parish of St. Marylebone of laying yellow deal blocks as close as they can be driven, and finishing the paving over with hot tar, using brushes to push the fluid forward to prevent accumulation on the surface, has produced the pavements of Marylebone-road, Great Portland-street, Oxford-street, and others, which are certainly among the finest pieces of paving in London. Another variety in the method of laying has been tried in Chelsea, where each block was dipped in a box containing a hot pitch mixture, and immediately placed close up to the adjoining blocks, and the surface of the paving was afterwards flushed over with hot pitch. Some years in a Midland town, where cement grouting was used, and afterwards a similar method in northern towns, where the joints were invariably made of pitch, has induced the author to form a preference for the bituminous joint, and, while timing that the weight of evidence is in support of that preference, he admits that on one head the case the other way. Mr. Blair summed up the merits and demerits of the two methods as follows:—Pitch grout allows joint to be reduced to  $\frac{1}{16}$  in. wide, and in case of soft wood the blocks may be close contact. Being more or less elastic, the joint absorbs expansion and gives way to contraction of blocks. The joint next the kerb does not alter from the time of the first completion of the work. The pavement is always impervious, and the pitch joints preserve the blocks. Traffic may be turned on to the work immediately. The rest of the work has been ascertained to be 7d. per superficial yard. The cement grout requires joint at least  $\frac{1}{4}$  in. wide; this eventually uses the formation of a corduroy road, the edges of the courses get bruised, the material being rigid is incapable of compensating for expansion or contraction in the blocks; there is invariably an irregular joint next the kerb as the blocks shrink. When dry they become loose in the jointing material; cement grout joints require to be left a week to set. The cost of the work is 6d. per superficial yard. If these conditions are accepted as correct, it remains that the cement joint is only prior to the pitch joint in respect of progress during wet weather, and the difference in cost of 1d. per yard by no means represents the economy effected in work caused by the expansion of the wood, apart altogether from the increased durability of the wood, and the greater cleanliness obtained.

Mayor Isaacs said the subject of most practical value was whether there should be joints or not in wooden pavements, what should be their width, and the material for filling the joints. He hoped there would be no pitched battles between engineers of the North of England and London, for it seemed they were quite at daggers drawn over the material which should be used. Having seen the effects of creosote in Liverpool and Manchester, he came to the conclusion that it was not a suitable substance in any roadway subjected to large traffic, where the traffic would cause the roadway to rock. The joints in wooden pavements were the recipients of a large amount of matter which gave off an offensive effluvia in certain states of the atmosphere and must lessen the life of the pavement. With regard to creosoting, he was of opinion that any value which might be obtained from the creosote was more than counterbalanced by having inferior material put into the joint. He was of opinion that engineers would have to turn their attention seriously to the sanitary aspect of wood pavements. There could be no doubt there was a hidden danger in wood pavements, and he had heard physicians say it was the cause of the large amount of diphtheria which London had been subject in recent years. Mr. H. P. Boulnois (Liverpool) expressed himself in agreement with Mr. Blair as to the use of bituminous joints for wood paving. With regard to traffic, he thought it should be reduced to a

standard, as they were absolutely working in the dark until they were able to compare notes with each other as to the weight a road would bear.

Mr. Wheeler (Westminster) said from his experience he was convinced wood paving had not a very long life, but that some other pavement would be introduced into the streets of London.

Mr. Tomkins (Marylebone) said he had been laying close-jointed wood pavement for twelve years with complete success.

On the motion of the President a hearty vote of thanks was accorded to the readers of the papers, and was acknowledged by Mr. Mason and Mr. Blair.

Mr. C. H. Cooper (Wimbledon) then read a paper on hospital tents at Wimbledon. He described the method of erecting the tents, the process of ventilation and heating, and remarked that their statistics bore out previous experience that recovery in tents is better than in houses. Thus, from October 1, 1893, to the end of 1893, all cases (206) that were treated at Durnford Lodge and in tents recovered, whereas of 142 cases treated at home during the same period three died. On the motion of Professor Robinson, seconded by Mr. C. Jones (Ealing), a hearty vote of thanks was accorded to the author, and acknowledged by Mr. Cooper.

#### THE LONDON COUNTY COUNCIL.

THE first meeting of the London County Council after the Christmas vacation took place on Tuesday at the County Hall, Spring Gardens, Mr. John Hutton, Chairman, presiding.

*The Rating of Land Values.*—Nearly the whole of the sitting was occupied in considering the adjourned report of the Local Government and Taxation Committee on the question of the rating of land values, a long report on the subject being brought up by Mr. Costelloe, the chairman of the Committee. Appended to the report were the following recommendations:—

(1.) That it is necessary without further delay to provide for a taxation of site values to extend to and be leviable upon all interests which share in the site value, and that for that purpose it is desirable to provide in the valuation lists a column for site values, including vacant land, in addition to the columns already provided for.

(2.) That the term 'site value' be defined as follows:—'The annual rent which at the time of valuation might reasonably be obtained for the land comprised in any hereditament, as a cleared site, if let for building by an owner in fee; or, if the land be not built on or let for building, a proportion equal to four per cent. of the price which at the time of valuation might reasonably be obtained for the land by such owner.'

(3.) That in cases where the occupation of land for profit has been rendered possible by drainage, embankment, or other works of an analogous nature, provision should be empowered to provide for the Council should be empowered to provide for the payment to be made to the owner of the site value so described, in respect of any expenditure on such works within twenty years before the valuation—provided always that any allowance contemplated under the above resolution shall be so expressed as to be independent of past or present municipal expenditure.

(4.) That, without prejudice to such other uses of the site value column as Parliament may determine, a new and specific rate should be imposed upon the site value, and that the site value rate ought to be started as a specific tax of so many pence in the pound.

(5.) That the tax should commence at a rate (to be named in the Bill) of 1s. in the pound upon the assessments appearing in the site value column.

(6.) That the Council should be empowered to alter the tax from time to time by an amount not exceeding 2s. in any one year, so that the rate shall not exceed 2s. in the whole.

(7.) That the new rate should be collected by the local authorities for the Council, and that a proper allowance for cost of collection should be made.

(8.) That, for purposes of recovering arrears, the Council should be empowered at its option to make and register an order charging arrears on the site.

(9.) That the rules of deduction above stated be approved.

(10.) That the method of collection and draft forms proposed by the sub-committee and approved by us be adopted as the basis of a scheme to be embodied in a draft Land Values Rating Bill.

(11.) That in any such draft Bill a clause should be included as to existing or future contracts corresponding with clause 13 of Mr. Dalziel's Land Values Bill.

(12.) That in any case where the whole of the site value as defined in resolution 2 cannot be obtained, used, or enjoyed by the persons to be charged, then the assessing authority should be entitled to take all the circumstances into considera-

tion, both in assessing the total amount to be inserted in the site value column, and in the apportionment of the rate among the various interests.

(13.) That all persons alleging that the rules of deduction do not apply to their case, either because of the last resolution or otherwise, should have power of appeal to the assessment authority in the first instance against the appointment.

(14.) That any person alleging that the rules of deduction do not provide for his case should have a summary right of appeal to the new Valuation Court proposed to be created or to any corresponding tribunal.

(15.) That the proposed Land Values Rating Bill should be applicable to all municipal areas in England.

(16.) That these resolutions, together with this report and the further papers circulated to the Council, be referred to the Parliamentary Committee with instructions to prepare a draft Bill on the lines indicated.

Mr. H. P. Harris moved the following amendment:—

"That this Council is of opinion (1) that the proposed valuation of the sites of all buildings as if they were 'cleared sites' would be speculative, complicated, and enormously expensive; (2) that the proposed 'site value' rate could not be equitably apportioned among the numerous and diverse interests in tenements; and (3) that the necessary revision of local taxation should be in the direction of making personal property, as well as real property, bear a fair share of local expenditure."

Mr. Debenham seconded, but the amendment, after a protracted discussion, was defeated by a large majority.

The Vice-Chairman of the Council, Mr. Charles Harrison, next moved:—

"That as it is imperatively urgent that a measure should be passed next session for the taxation of ground or site values, and as this cannot be done unless the Bill be brought in as a Government measure, the Council is of opinion that all lands situate in municipal areas, and whether partially or entirely covered with buildings or existing as vacant land, should be made directly liable to local and other taxation, and for that purpose should be entered in a separate column in the valuation lists; and that no contract should be allowed to affect any charge falling or imposed on the land value as stated in the land value column. That with a view to the framing and introduction of such a measure a copy of this resolution be forwarded to the Government, together with the following documents:—Report of the Local Government and Taxation Committee, November 29, 1893; Land Values (Taxation by Local Authorities) Bill, introduced into Parliament February 1, 1893; memorandum by the Vice-Chairman of the Council on the subject of that Bill. Reports by the valuer of the Council upon the above Report and Bill, and the various documents therein referred to; and that the Chairman, Vice-Chairman, Deputy-Chairman of the Council, the Chairman and Vice-Chairman of the Committee, together with Mr. Stuart and Mr. Wood, be a Committee to confer with the Government as to the introduction of a Bill, and to report to the Council."

Professor Stuart seconded the amendment. Mr. Costelloe, on behalf of the Committee, accepted the amendment, which was adopted on a show of hands by 54 votes to 18.

Mr. Boulnois moved to add these words, "it being understood that the Council not having considered the details of the report of the Local Taxation Committee it is not committed to any particular course of procedure."

Mr. Westcott seconded the rider, and was speaking at seven o'clock, when the debate stood adjourned.

*Legal Assistance to District Surveyor.*—The report of the Building Act Committee contained the following paragraph, the recommendation being agreed to:—

"Proceedings were taken by the district surveyor against certain builders for the recovery of his fees in respect of buildings erected without notice on surplus land belonging to the London and North-Western Railway Company, in Maria-street and Harwar-street, Shoreditch, the builders having contended that the erections in question were exempt from the provisions of the Metropolitan Building Act, 1855. The magistrate, however, decided that the exemption clause did not apply, and at the request of the company's solicitor agreed to state a case for argument in the High Court. Mr. H. Lovegrove, the district surveyor, has asked the Council to render him legal assistance in support of the magistrate's decision, and as the point whether the buildings in question are exempted or not from the provisions of the said Act is of some importance, we recommend—

That the solicitor be instructed to render such legal assistance as he may deem necessary to Mr. H. Lovegrove, district surveyor, in support of the magistrate's decision when the case comes on for argument in the Queen's Bench Divisional Court."

*Sewer Emanations.*—The Main Drainage Committee brought up a report containing the



following paragraph, the recommendation being agreed to:—

"On March 13, 1891, the Council authorised us to retain the services of an expert to make observations on the organisms in sewage and sewer air under various conditions, and the effect thereon of antiseptics or other chemicals. Mr. J. Parry Laws was engaged for this purpose. Having received a first report of the result of his investigations, we deemed it advisable that the experiments should be continued, and the Council, on November 22, agreed to continue the services of Mr. Laws with the view of ascertaining the effects produced by organisms on sewage, and whether the conditions of the air in a small experimental sewer with intermittent flows of sewage are similar to those found to exist in large sewers, also on the condition of sewer air in stagnant sewers and other places where abnormal conditions exist. These experiments he has now completed, and his report has been presented to us. Although sewer air has for a long time been regarded as dangerous and a likely source of infection in certain specific diseases, there has hitherto been no attempt to verify this hypothesis by scientific research. Now that it has been submitted to the test of a long series of scientific experiments, the hypothesis has been found to be incorrect. The results of the investigations summarised in the two reports made by Mr. Laws prove conclusively that the belief, that the micro-organisms of sewer air are almost invariably less in number than the micro-organisms to be found in fresh air surrounding the sewer at the same time in the same vicinity, even when the sewer air is examined under the most varied conditions; they, moreover, prove that the micro-organisms of sewer air are related to the micro-organisms of fresh air, and not to those of sewage. These facts furnish strong probable evidence that the micro-organisms in sewer air are exclusively derived from the fresh air which gains access to the sewer by ventilation. If the micro-organisms were derived from the sewage and sewer walls their number would increase with the length of sewer traversed, or with the length of time the air had been in contact with the source of contamination. Although one is led almost irresistibly to the conclusion that the micro-organisms in sewer air do not constitute any source of danger, it is impossible to ignore the evidence, though it be only circumstantial, that sewer air in some instances had apparently had some casual relation to zymotic disease. It is quite conceivable, though at present no evidence is forthcoming, that the danger of sewer air causing disease is an indirect one: it may contain some highly poisonous chemical substance, possibly of an alkaloidal nature, which, though present in but minute quantities, may nevertheless produce, in conjunction with the large excess of carbonic acid, a profound effect upon the general vitality. We consider that the information obtained from these experiments is interesting and valuable, and we are of opinion that they should be continued further in certain directions not hitherto ascertained, and with this view we have asked Mr. Laws, in conjunction with the chemist of the Council, to suggest what further experiments should be made. We have directed a copy of the two reports already made by Mr. Laws to be sent to each member of the Council, and we also consider it desirable that each of the local authorities should be supplied with a copy. We recommend—

"That a copy of the reports be forwarded to the City Commissioners of Sewers and the several vestries and district boards."

The Council adjourned at twenty minutes past seven o'clock.

ANOTHER ROMAN FIND AT CHESTER.—Mr. F. Haverfield writes to the *Manchester Guardian*:—"One more Roman inscription has to be added to the long list of those which have been discovered inside or near the north city wall of Chester. This new find is a tombstone commemorating one Q. Domitius Optatus, of the Claudian tribe, born at Virunum, now Klagenfurt, in Styria. Probably he was a soldier in the garrison of Deva, though the inscription, which is imperfect, does not, in its present shape, state this fact. The stone was found in the embankment on the north (outer) side of the wall about thirty yards west of Pemberton's Parlour. This latter, which is a sort of bastion in the wall, lately fell, and the inscription was detected in the course of the repairs. The position of the stone is curious. It is usually thought that the north wall of Roman Chester did not extend so far to the west as Pemberton's Parlour, but turned southwards somewhere about Morgan's Mount. The occurrence of this stone further west suggests, at first sight, some doubts as to this view, but the evidence is perhaps not very substantial. An opening made in the wall in connexion with the repairs to Pemberton's Parlour revealed no Roman masonry, and a stone which lay in the earth outside, like the one newly found, may well have been moved from its place. The detection of the stone is due to Mr. T. Matthews Jones, the City Surveyor, whose watchful care over relics of Old Chester has laid antiquaries under many obligations."

## Illustrations.

### BRASS OF THE HEERS, FROM THE MUSÉE D'ANTIQUITÉS AT THE PORTE DU HAL, BRUSSELS.

THIS fine brass hangs upon the wall of the right-hand room on the ground floor. As the brass hangs somewhat forward, it is difficult to rub it, and a judicious arrangement of wafers is necessary to attach the paper for rubbing on to the brass.

A capital account of this brass is given in that best work on Continental Brasses, by the Rev. — Creeny, of St. Michael-at-Thom's, Norwich. One advantage of Mr. Creeny's work is that the pictures are facsimile reproductions—reduced in size, of course—of the rubbings themselves, much superior to the ordinary drawn engravings of other works on brasses. The Director of the Museum of Antiquities at Brussels is a keen archaeologist, and is always pleased to obtain information on brasses.

This brass measures 8 ft. 6½ in. by 5 ft. 1½ in. The illustration is from a rubbing by the Rev. Tennyson d'E. Jesse.

### MANCHESTER MUNICIPAL TECHNICAL SCHOOL.

THIS illustration, which is from a drawing exhibited in last year's Royal Academy, shows the exterior aspect of the building, of which Messrs. Spalding & Cross are the architects. Unfortunately, owing to the absence of both the architects from town, they did not receive our usual request for a plan of the building until too late to comply with it. We can therefore only give a few notes as to the main arrangement of the plan. Owing to the necessity for providing adequate external light and ventilation to the working and administrative rooms, it was considered advisable to place these in the four blocks forming the frontages to the various streets, placing the entrance-hall or museum in the large internal area thus formed. The corridors, 9 ft. wide, are to be well lighted, and arranged so as to be suitable for the exhibition of designs and models, as well as for the students' lockers. The main staircase is at the extreme end of the Museum Hall. A bicyclist's entrance is provided with an inclined plane to a room in the basement, and a special staircase from this; an indication of the practical importance which the cycle is attaining in modern life; possibly a good many students would attend such a centre of education by this means who otherwise could not conveniently reach it. Four spacious special students' staircases are provided, all available for use in connexion with the large lecture-hall on the first floor, which is made readily accessible from all parts of the building.

The mechanical engineering department is placed on the basement floor, efficiently lighted either from side windows or skylights; the room for constant temperature, and the ice-room, in the sub-basement; the department of applied physics and electrical engineering on the ground floor; textile trades in the basement; applied chemistry on the third floor, except the lecture-rooms, which are on the second floor; dyeing and finishing on the first floor; brewing and metallurgy on the third floor; building trades on the first floor; printing and lithography on the third floor; commercial subjects on the second floor; industrial design on the fourth floor, all the principal rooms having top studio windows as well as the ordinary windows. Departments for women's work are on the fourth floor.

Special care has been taken to place the lecture and class rooms well away from the noise caused by the machinery of the textile department. The principal lecture-rooms from the widest street in order to obtain the maximum amount of light. All the private or professors' rooms face the principal street. In regard to architectural style, a free treatment of Francis I. Renaissance has been adopted, as admitting of the incorporation of sash windows and of a large expanse of window without interfering with the architectural design.

The lighting is to be by electric light, but gas-pipes will be laid on in case of any sudden failure of the electric light.

The walls generally will be of local "commons," the fronts next the streets being faced with red Ruabon facing bricks; the dressings of Bath terracotta. The walls of internal courts are to be faced with white glazed bricks up to the first floor level, the roofs of front buildings covered with small Whitland Abbey green slates, and the back roofs with blue Bangor slates. The floors throughout will be of fire-proof construction, and

all class-rooms and lecture-rooms not required to have impervious paving (such as granolithic) will be floored with wood blocks.

Two lifts are provided, and speaking-tubes will be fitted throughout the building.

The building is not yet actually commenced. The system of ventilation and heating which will probably be adopted is the combination known as the "Sturtevant Blower System," which, reduced to its primary parts, comprises a fan of a centrifugal type, motor, heater, a complete system of air-distributing ducts (together with the necessary means of generating steam and conveying it to the apparatus), and a general arrangement of ventilation planned on the "plenum" system.

### WAYSIDE NOTES IN EAST ANGLIA.

AMONG the comparatively untrodden byways in East Anglia, there are to be found many interesting specimens of domestic architecture, but little known by reason of their remoteness from railway communication. They are doubly valuable to the student because their obscurity has in many instances delivered them from the scourge of too much restoration and improvement, and they remain in much the same form as when they were first erected.

It is gloomy to contemplate these fine old manor houses and halls, falling gradually to decay and occupied by agricultural labourers, and I have thought it might perhaps be of service to call attention to one or two of great interest, but little known to the community at large. About six miles N.N.E. of Clare is a small scattered village called Hawkedon, standing on pleasant rising ground near a tiny rivulet, and but sparsely populated.

It is divided into two manors, Hawkedon Hall, now a farmhouse, and Thurston Hall, of which I give three illustrations.

Thurston is a very ancient manor; it is called in Domesday, Thurstanestun, and one of its earliest lords was said to have been Roger Fletaviensis, who was coeval with William the Conqueror.

In the fourth of Richard II. Gilbert d'Umfreville died, seised of the manor of Thorston, or Thurstruston, in Hawkedon, and from him it passed into the possession of the Multons, and afterwards it was vested in Sir Robert Harrington, who died seised of it seventh of Henry IV. in right of his wife, who was daughter of Sir Nigel Loring, Knight of the Garter.

In the reign of Edward VI. it belonged to the Everards, and through them it came to Geoffrey Maltbyard. Then after them it passed to William Gilby, who sold it to the Gotts family.

The present owner of the property is J. H. Porteus Oakes, of Nowton Court, near Bury St. Edmunds.

The house as it now stands is Jacobean, and is dated over the porch and inside the panelled drawing-room 1607.

It is arranged on the customary plan of the period, with a projecting porch leading into a large central hall, on the right-hand of which are the principal apartments and on the left kitchens, butteries, and so forth.

It is constructed entirely of timber studwork filled in with bricknogging, and is in very fair preservation.

The rooms are mostly panelled, the drawing-room being of exceedingly fine detail, with elaborate mantel and overmantel and open fireplace.

In the hall the reveals of the windows are enriched with carved heads in medallions, and the carving has a strong Flemish feeling. The chimney-stack at the rear of the hall is exceedingly fine, having four very elaborate shafts of moulded brick in diaper patterns springing from a square brick base. This chimney is shown in my sketch of the back, but is hidden in the other sketches by the porch gable.

Inside the porch, the door-head of which is richly carved, there were, until lately, two elaborate seats, but these have been removed by the present owner. The outer gates of the porch are small, and are filled in with turned and twisted balusters.

The house offers an excellent study to anyone who wishes to see one of these manor houses with all its original details and arrangement but little altered or tampered with.

Leaving Thurston Hall, a walk of one mile brings us to Swan Hall, another old house in the same parish, and nearly identical in age and characteristics, but more elaborate in detail.

This was a house of considerable importance, but part only now remains. It derived its name







NOTES

ENGLIA

S. C. RILEY













Thurston Hall  
London, E.C.



Thurston Hall  
London, E.C.



MILL HOUSE, CARLISLE. THE CASTLE STREET FRONT. MR. CHARLES J. FERGUSON, F.S.A., ARCHT. ET.











Royal Academy Exhibition, 1893









from the family of Swann, who originally possessed it, and in the windows the arms of Swann can still be seen—*azure on a fesse, or between three swans, naiant arg.*, three roses *gules*, bearded *vert*, seeded of the second. From the Swanns it descended to the Abbot's, who probably built the present hall, as the initials W. A. appear over the outside of the bay window on ground floor, divided by a merchant's mark.

From the Abbots it came into the possession of the Rev. Chas. Edward Steward, and it was sold by him after 1764. It has since belonged to the Rev. Roger Kedington, of Rougham, who died in 1818.

It now belongs to Geo. Weller Poley, Esq., of Bosted Hall.

The gable to the road is a very fine one, full of work and carving, and the design is exceedingly quaint in detail. The side furthest from the spectator in the sketch preserves its old brickwork finish, but the rest has been stuccoed over. The chimneys are very good. The plan and arrangement was originally similar to Thurston Hall. But the central hall has been subdivided up, and its identity lost. The main sitting-room preserves all its features of panelling and finishings nearly complete.

Bentley Hall is five and a-half miles south-west of Ipswich.

The Manor of Bentley, together with other lands in the same parish, belonged to the Augustine Priory of Holy Trinity at Ipswich, for in the Charter of King John to the Priory it is stated "By the gift of Hervey of Dodneis the church of St. Mary, Bentley, with all its appurtenances. Lands in Bentley and Dodneis by the gift of William Tollemache and Osbert de Reimes, and Harvey and Thiede his wife, and William their son, and of the merchant Godwin. By the gift of Payne the moneyer, Dugglesland in Bentley."

At the Dissolution the manor was granted in the 36th of Henry VIII. to Lionel Tollemache, whose family, in 1582, erected the present hall,\* the property thus reverting to the successors of the original owners. The Tollemaches afterwards removed to Helmingham Hall, which they have occupied ever since. They acquired it by the marriage of a Lionel Tollemache with the heir of — Helmingham, of Helmingham.

The front of Bentley has been much altered and renovated, but the sides and back still preserve the old outlines, and on one face the carved cill to the upper studs is still visible, having shields and flourishes in continuous ornament. One shield bears the Tollemache arms *argent, a fret sable*; another bears the initials S. T., with the date 1582; a third shield has the initials, L. T.

The present Lord of the Manor is W. J. Deane, Esq.

On the right of the sketch is a fine old detached timber building of most interesting character, now the stables, doubtless formerly occupied by retainers. The farm buildings, especially the great barn, are well worth careful examination, being of bricknog studdwork, with high-pitched gables of solid brick.

Comerages at Writtle, two miles from Chelmsford, is an old building, of sixteenth-century work, and formerly a residence of some importance. But little is known of it. It is situated on the south side of Writtle-green, and is now divided up into tenements.

JOHN SHEWELL CORDER.

#### TULLIE HOUSE, CARLISLE.

WE illustrate to-day the Castle-street entrance to Tullie House, Carlisle. Our readers will be conversant with the general history of the undertaking from the description and illustrations which appeared in our issue of May 9, 1891, and the recent correspondence thereon.

The buildings and gardens of Tullie House, and a connecting link to Castle-street, were purchased by a body of subscribers, of whom Lord and Lady Carlisle, the late Bishop Goodwin, and a few others, were the pioneers, and were presented to the Corporation of Carlisle for the purposes of a School of Art, Free Library, Museum, &c.

The Corporation of Carlisle have erected the various buildings required on the site of the north wing of Tullie House, and of a portion of the gardens, and to these buildings this gate house gives access from the main street through a courtyard.

It is built in ashlar of local redstone in irregular courses, the details being treated on a somewhat larger scale than usual, for a lighter coloured material. The turret is roofed in copper, the

down spouts, waterheads, and carriers are of lead, and the gates to the archway of wrought-iron, with the City arms worked in the grille.

The front has been carried out from the designs of Mr. C. J. Ferguson, architect, of Westminster and Carlisle.

The illustration is from a drawing by Mr. E. Ridsdale Tate.

#### ARCHITECTURAL SOCIETIES.

LIVERPOOL ARCHITECTURAL SOCIETY.—The fourth ordinary meeting of the forty-sixth session of this society was held on Monday in the Royal Institution, Colquitt-street. Mr. H. Hartley, the President, was in the chair, and Mr. W. H. Bidlake, M.A., of Birmingham, read a paper on "Imagination in Planning." We have no space to devote to the paper this week, but we may be able to return to it next week.

SHEFFIELD SOCIETY OF ARCHITECTS AND SURVEYORS.—The ordinary monthly meeting of this Society was held at the School of Art on the 16th inst. Mr. E. M. Gibbs presided, and a paper was read by Mr. H. W. Lockwood on "Symbolic Architecture," in which no attempt was made to trace symbolic forms to their origin, this more serious treatment being reserved for a future occasion. The writer, taking some of the most recent and best-known architectural works in the city, attempted to deduce from their design evidence of symbolic intentions on the part of their designers, and it was urged that, to be thoroughly successful, a building should by its design tell the beholder for what purpose it was designed. From the discussion which followed, it transpired, however, that the symbolism discovered in the buildings had had no existence in the minds of the designers.

LEEDS AND YORKSHIRE ARCHITECTURAL SOCIETY.—The annual dinner of the Leeds and Yorkshire Architectural Society was held on the 8th inst. in the Queen's Hotel, Leeds. The chair was occupied by Mr. George Bertram Bulmer, the President. After dinner a toast-list was gone through, and the Chairman prefaced it with a sympathetic allusion to the demise of the late Mr. W. J. Mettam, who had acted as honorary secretary to the society. Mr. George Colson proposed "The Army, Navy, and Volunteers," and Colonel E. Wilson responded. "The City and Commerce of Leeds" was proposed by Mr. Leonard Cooper, and responded to by Alderman Hepworth, President of the Leeds Mechanics' Institute. The toast of "The Royal Institute of British Architects and the Allied Societies" was proposed by Mr. W. H. Thorp. He said the Institute and allied societies existed largely for the purpose of promoting intercourse between the various members of the profession, in bringing subjects of architectural interest before them by means of papers read at the meetings of the various societies. They also kept in view the education of the younger members of the profession. The Institute of British Architects might be looked upon in the light of a sort of University. It was not an educating body, but it was an examining body. Those examinations had been largely taken advantage of by the younger members of the profession. Mr. William Emerson, honorary secretary of the Institute, replied. He alluded specially to the meeting held in Liverpool, the outcome of which was the establishment of a scheme to assist young gentlemen who proposed to enter the profession, and who were situated at long distances from the large towns, and found difficulty in obtaining the means of study. The Institute and the allied societies now formed a centre for the purpose of supplying information to the younger students, and there was every hope that the effort would yield good fruit.

At the present day the motto was union was strength; but there was a certain number of professional men who, for some reason, held themselves aloof from their brethren, and indulged in jibes and sneers at them. Such conduct did not advance architecture or the profession of the architect. Those things showed how much need there was for architects to unite to uphold the honour and dignity of their own profession. Mr. Edward Solomons, of Manchester, also responded. He said the idea the public had as to the means the architect had at his disposal to produce the buildings he did was quite extraordinary. They must let the public know that there was something in the architect beyond the mere builder. Mr. Edward Mitchell-Gibbs, of Sheffield, in contributing to the response, said he was disappointed to find that so little had come of the proposal to establish a chair of architecture for the northern societies. In his opinion,

the only way to meet the difficulty of the education of architects was to establish in some part of the country an architectural college, possibly in the northern district, by a combination of such provinces as Liverpool, Manchester, Leeds, Sheffield, and Nottingham, all of which were within easy railway communication of each other. The Royal Institute should, as soon as it could, abandon its position as an examining body, and undertake the teaching of the architects of the country. To him there was nothing more painful in the present style of architecture than the want of proportion. Some architects did not seem to have the slightest notion of it. As an example of noble proportion, he cited the Leeds Town Hall, which, in his opinion, was one of the master productions of the present century—remarkable for its splendid outline and masterly restraint, a standing protest against the present style of architecture, with its affectation of irregularity and confusion of plan. The toast was responded to by Mr. Alfred Henry Paget, of Leicester, and Mr. William Hepper, of York. Mr. William Emerson proposed, "The Leeds and Yorkshire Architectural Society." In the course of a short speech, he expressed disapproval of Mr. Gibbs's suggestion that the Institute should be an educational body. It was, he thought, quite an unreasonable suggestion, and he was of opinion that the education of architects should take place before they had anything to do with the Royal Institute of British Architects.

In responding, the Chairman alluded to the success which had attended the operations of the society. "Literature, Science, and Art," was proposed by Canon Scott, and responded to by Mr. J. J. Wilson and the Rev. J. H. Dudley Matthews. The last toast was, "Our Guests," proposed by Mr. E. J. Dodgshun, and responded to by Mr. John Harrison, the Town Clerk.

CARLISLE ARCHITECTURAL, ENGINEERING AND SURVEYING ASSOCIATION.—At a meeting of this Association held on the 10th inst. in the Town Hall, a lecture was given by Mr. Wm. Pogson on "Tramways." Mr. Higginson presided. Dealing with the origin and development both of the ways and methods of haulage, details and sketches were given and explained of the different systems adopted from time to time both in this country and abroad, especially in America, up to the latest method of girder rail and way now universally adopted for mechanical haulage, and as laid down in 1893 by the Huddersfield Corporation, the only Corporation up to the present time which has laid down, worked, and developed their own line. The various systems of electric and steam haulage were also explained and illustrated, and the advantages and disadvantages of each for different towns were also dealt with, together with the cost of the systems already laid down. A discussion followed and a vote of thanks was passed to the lecturer.

EDINBURGH ARCHITECTURAL SOCIETY.—A meeting of the Edinburgh Architectural Association was held on the 10th inst. in the Royal Institution, Mr. W. W. Robertson presiding. The Chairman referred to the loss sustained to the Association through the deaths of Mr. Thomas Henderson and Mr. J. M. Bryson. Upon the motion of the Chairman, Mr. David Robertson, A.R.S.A., was elected a member of the Council. Photographs of ancient buildings in Ceylon were exhibited by Mr. A. Muirhead. A paper by the Rev. Robert S. Mylne, F.S.A. (Lond.), on "The Influence of the Mylnes on the architecture of Edinburgh," was read by the Chairman. No individual name of any of the early architects, he stated, stood out as the originator of a single style of architecture. Singularly few names were connected with any of the vast Gothic cathedrals scattered over Europe. In the case of the Mylne, the name was connected with a vast number of structures through a long period of time. Abbot Alex. Mylne, the earliest, was a famous mason in the reign of James III. John Mylne, of Perth, at the request of the Town Council of Edinburgh, completed an ornamental statue of James VI. at the Netherbow Port. He also constructed the City Cross and a water pond at Holyrood in the reign of Charles I., besides making the celebrated sun-dial in the Royal Gardens at Holyrood. His son John succeeded to the office of master mason, and under his direction the Tron Church was completed in 1647. He also repaired the great east window in St. Giles' Cathedral. Robert Mylne, of Balfargie, was best known as the builder of Holyrood Palace, which had been maintained almost unaltered for two centuries. In 1674 he busied himself in introducing a large water supply at the head of the West Bow. Mylne's Square,

\* In the reign of Henry III. Hugh Tollemache paid a fine to Ipswich for freedom from toll for himself and his vassals in Bentley.



Writers' Court, and the steeple of Heriot's Hospital also presented proofs of his industry. In 1745 the Edinburgh Royal Infirmary, in the Classical style, was completed by Thomas Mylne, of Powderhall, the eldest son of whom, settling down in London, constructed Blackfriars Bridge. The most important work of the latter in Edinburgh was St. Cecilia's Hall. William Mylne, his brother, built the North Bridge, which was the last important work executed by the Mylne family in Edinburgh. The palace of Holyrood was by far the most important structure connected with the name of Mylne. It was perhaps a little gloomy, but had the reigning King not objected, there would have been more external decoration. In all their work there was some want of originality, but it was the part of a wise man to adhere to the unsurpassed models of antiquity which still existed.

#### ARCHÆOLOGICAL SOCIETIES.

**ROYAL SOCIETY OF ANTIQUARIES OF IRELAND.**—The annual general meeting of this society was held in the library of the Royal Dublin Society's House, Kildare-street, on the 9th inst. Mr. John Ribton Garstin, F.S.A., senior Vice-President, occupied the chair. The report of the Council for the year 1893 was submitted. It contained a reference to the death of the President, Lord James Wandesforde Butler, "the last survivor of that band of pioneers who, forty-four years ago, in the City of Kilkenny, laid the foundation upon which the Society has been raised." The report also stated that there are now upon the roll of the Society the names of 189 Fellows and 1,051 members, the total number of names, 1,240, being 50 more than at the close of the year 1892. The Photographic Committee, which was formed twelve months ago, held several meetings during the year. Mr. J. L. Robinson had consented to act as hon. curator of the collection, and considerable progress had been made in classifying, according to counties, the existing photographs of antiquarian objects. The index to the first nineteen volumes of the "Journal" is now practically completed, and will shortly be ready to go to press; also the catalogue of the objects in the museum of the society in Kilkenny, which is being prepared by Mr. J. G. Robertson. The meeting next proceeded to elect a President for the year 1894. The following gentlemen had been nominated:—Rev. Denis Murphy, S.J., M.R.I.A.; Mr. Thomas Drew, R.H.A., F.R.I.B.A.; Vice-President, and Lord Walter Fitzgerald. Lord Walter Fitzgerald withdrew his name, and the voting took place between the two first mentioned gentlemen, with the result that Mr. Drew received 57 votes and Father Murphy 44. The Rev. George R. Buick, Vice-President, read his second paper on the Crannog of Moylurg. Mr. T. J. Westropp read a paper descriptive of the Franciscan Priory of Ennis, and the tomb of O'Brien, King of Clare, found therein, which is remarkable for the panels of grey marble, on which there are designs of German origin, depicting Scriptural subjects. Colonel P. D. Vigors exhibited ancient leg-letters, found in County Carlow; stone axes found in New Caledonia, French specimens of stone axes, and an aboriginal stone hammer from Australia. Mr. Robert Cochrane, hon. secretary, announced that by permission of his Grace the Archbishop of Dublin the members would have an opportunity of visiting the recently-discovered pagan sepulchral mound in the grounds of Old Connaught, Bray.

**SOCIETY OF ANTIQUARIES OF SCOTLAND.**—The usual monthly meeting of this Society was held on the 8th inst., Mr. Gilbert Goudie in the chair. The first paper was an account by the Rev. George Lowe, B.D., of a cemetery of the Bronze Age, containing eighteen urns, recently discovered at Kirkmark, Musselburgh. The second paper was a notice of the church bell and some other antiquities at Kettins, Forfarshire, by Mr. Alexander Hutchison, F.S.A., Scot., Broughty Ferry. A small sepulchral slab, with a Calvary cross and a pair of shears incised on one side, and other architectural fragments discovered in the course of some recent alterations in the church were described, and the inscriptions and arms on the parish communion cups noted. In the next paper, Mr. J. M. Mackinlay noticed the various localities in East Lothian associated with the memory of St. Baldred, who was said to have chosen the Bass Rock as his retreat. The last paper, by Mr. F. R. Coles, dealt with the stone circle at Holywood, Dumfriesshire, chiefly with reference to the so-called cup markings on some of the stones in the circle, as mentioned by the

late Professor Sir J. Y. Simpson. These, however, on careful examination, the author found to be mostly if not altogether natural.

### Correspondence.

To the Editor of THE BUILDER.

#### "STAINED GLASS AND DESIGNING."

SIR,—In your notice on p. 499, December 30, of Mr. A. Pilkington's window, you say that the drawing was exhibited in my name at the Royal Academy. And in your note to the letter of "A," on p. 39, 13th inst., you say that you gave the facts as communicated by the architect.

Are these statements fair to me, or accurate? Till you told me, I was not aware that any drawing bearing my name, or with which I had in any way to do, was in the Royal Academy. And even then I had no idea what it could be. I wrote to you, in reply, at the time explicitly, to this effect. Whoever sent the drawing took a great liberty in sending it under my name, without my knowledge or consent. In the *Builder* it is suggested that I have assumed a position to which I had no right, and that I have taken credit for other people's work. I have not done so.

The facts do not justify any such suggestion or inference. Your withholding my statement that the drawing in question, sent to the Royal Academy in my name, was so sent without my knowledge or consent, gives the whole affair an entirely wrong complexion.

It is a mistake to regard a stained-glass window as if it were an independent picture that can be placed, or hung up, anywhere. To be thoroughly successful, it must suit its surroundings. The building is not to be regarded as little more than a frame for the stained glass. Stained glass—if worthy—is a part of the decoration of the building, and as such should come under the direction and control of the architect, who should, to say the least, be able to prevent mistakes of scale, position and colour, being made. An architect who has studied the subject should be able to do much more than this.

J. MEDLAND TAYLOR.

\* \* We did not recollect that Mr. Taylor had distinctly disclaimed having sent the drawing to the Academy, but we now find that the drawing was sent by Messrs. Heaton, Butler, & Bayne, with their name on it and the words "under the superintendence of Mr. Medland Taylor, and the R.A. Secretary adopted the latter name in the catalogue. So far, therefore, we have unintentionally implied what was unjust to our correspondent. At the same time, we remember that, in the course of some correspondence on the subject, when we wrote to ask him if we could publish the drawing, Mr. Taylor entirely defended the architect's claim to the design in such a case; and we may add that to the description of the window which he sent us he appended a long and enthusiastic comment on the admirable result which had followed from the co-operation of the architect and his client in the design, which we omitted as irrelevant, as well as for other reasons.—Ed.

#### THE STRUCTURE AND PHYSICAL PROPERTIES OF BUILDING STONES.

SIR,—Referring to the observations made on p. 20 of your issue of 5th inst., what the writer says respecting a gang of quarrymen sometimes migrating from one quarry to another and taking the quarry-mark with them is quite correct in many instances, but my predecessors and myself in connexion with the quarries now worked by myself, foresaw this difficulty many years ago, and have always insisted that each separate quarry, and not each distinct gang, shall have a mark of its own. Therefore, the quarry-marks in our instance are stationary, and do bear a practical value to a certain extent, and are not migratory in the manner the writer has mentioned. Some architects have occasionally specified stone to come from a certain quarry, bearing a certain quarry-mark, and have put into their specification a clause which it is impossible to fulfil, no matter who may profess otherwise, because I suppose upon the average it may be definitely reckoned that no separate quarry gang is able to produce more than about 500 tons of stone per annum from one quarry, and in large jobs there are frequently thousands of tons of stone required, and it stands to reason that, if the job were to be constructed of stone obtained solely from one quarry, it would take years instead of months to construct the masonry alone.

There is, however, another feature to be considered, and that is: In many instances there are two beds in one quarry, one a weather bed, and one not so. The weather bed is the one, of course, which should be used for exterior work, hence out of the 500 tons which the quarry might produce during the twelve months, not more than, say, 300 tons would be of the weather bed, hence a further argument to show the impracticability of

specifying stone from a particular quarry bearing a definite quarry-mark. What presents itself to my mind as being a better way is to specify a locality, before doing which, however, the architect should assure himself that there are a sufficient number of quarries in that locality to produce the stone in the required time to enable him to complete his building.

Moreover, as years go by, the quarry which ten years ago was specified and noted for producing satisfactory stone, is altogether worked out, or worked away from, and one occasionally finds stone now specified to come from a certain quarry which years ago became exhausted, and the stone now being produced, although bearing the same name, as a matter of fact is raised from a spot sometimes hundreds of feet away from the spot from whence the original stone which obtained favour, and was specified, was produced.

A more intimate knowledge of the circumstances respecting quarries and stone seems to me to be required in the profession generally, and I consider the papers you are now publishing in your journal will go a great way towards disseminating that knowledge. A QUARRY-OWNER.

#### PRIME COST.

SIR,—Having heard the quantity surveyor's opinion on this subject, perhaps the views of the builder may be of interest, and conduce to a more understanding of the principles really involved.

What is "prime cost?" It is first cost, actual cost, or out-of-pocket cost, just which way you like to look at it; that that is its real meaning, I take it, there can be no doubt. All business men, then, whatever trade they may belong, will be disposed to admit that this out-of-pocket cost of the articles they sell is not a thing which outsiders ought to be made acquainted with, no matter whether it is groceries, drapery, clothes, bread, stoves, gas-fittings, or wall-papers. The customer does not seek to know the "prime cost" of any commodity when he deals direct with a tradesman. Why, then, should his representatives, the architect and quantity surveyor seek to know it.

As you, Mr. Editor, kindly intimated, prices are named for certain things, because there is no other convenient way of describing the quality required; but the usual clause in "quantities" about "prices mentioned being clear of trades discounts" is a gross piece of impertinence, which the customer himself is not guilty of when dealing direct with a builder, and our contention is that neither of his agents should arrogate to themselves the right to do that which their client would never dream of doing.

To do architects justice, they rarely meddle with trade discounts when, as is often the case, they go direct to the builder for an estimate, it is only when Mr. Quantity Surveyor, with his usual bouncing dictatorial inquisitiveness, appears on the scene, that trouble arises.

The assertion by Mr. Leaning that quantity surveys are always conversant with the discounts is either empty bluster, and, as such, reprehensible; or, if it is true, there can be no occasion for wanting the invoices at all, for the individual who selects the articles under a provision would naturally keep account of the prices of them; or, again, if it is true, it can only be by underhand methods, which no men of honour would stoop to commit.

In spite, however, of what surveys may do, this P.C. will always remain more or less a will-o'-the-wisp, and the most stringent clauses for reaching it will always be frustrated by the ingenuity of builders, backed up, as they always will be, by the sympathetic feeling which subsists between those engaged in trade. The depths of what Mr. Leaning calls "meanness" on the part of merchants and manufacturers, but which is merely justifiable secrecy, has never yet been plumbed, and never will be plumbed. So long as inquisitive outsiders attempt to meddle with trade discounts, so long will there be subterfuges and concealments.

The extremely childish remark upon the reticence of builders in this matter is unworthy of a man in Mr. Leaning's position; he ought to know that it is a characteristic of every trade, including also the quantity surveying profession; for I take it that even they would not like the customer to know the "prime cost" of preparing the quantities.

Cons away with all that meddlesome interference with trade discounts. It took some little time to convince architects that quantities ought to form part of the contract; a little reflection will convince them that they are on the wrong tack in this matter also, when they allow the surveyor to put P.C. instead of list values of articles.

Competitive profits only are more likely to be paid by quoting catalogue prices than fallacious P.C.'s, for the builders desirous of getting the job (there would be no competition unless this desire existed) would in some way make allowance when they felt confident of receiving the trade discount, either by putting the fixing at a low rate, or knocking something off the main total.

To take an opposite illustration of the principles involved, supposing roof to be provided for some

\* Some of us are not convinced of that yet.—Ed.



ing, the quantity surveyor at the usual rates would be 2s. 6d. for simply writing two lines. "Oh!" he will immediately exclaim, "it is the remuneration for the whole bill which ought to be considered." Just so, and for the same reason it is profit on the whole contract which ought to be in consideration, and not the discounts or profits on particular items.

A BUILDER'S MANAGER.

# FLUSHING OF WATER-CLOSES.

IR.—You have been good enough to notice in my last issue a supplementary catalogue of special water-closet apparatus which I have lately ordered, and having reference more particularly to my new syphonic discharge apparatus, "The set of the Century." I note that you refer to the amount of water necessary to efficient flushing, which is at present restricted by the water companies' regulations to 2 gallons; and while there is no doubt that the purely mechanical action (by which water companies' engineers would apparently endeavour to justify such regulation) can be effectively formed with this very limited quantity, I unflinchingly assert that the experience of practical sanitarians, demonstrated by results of tests recently issued by the Sanitary Institute, unquestionably affirm the opinion always advocated by me that nothing more than this is required, and that a minimum flush of 2½ or 3 gallons to a maximum of four or even 4½ gallons (in accordance with local circumstances and the requirements of position in relation to the drain) is absolutely essential to an efficient sanitary result.

For example, it has already been conclusively shown that a two-gallon flush discharged through any ordinary form of flush-down closet, fixed at the end of a 4-in. branch drain, is valueless for the purpose designed, of conveying excreta direct to sewer, and days must often elapse before this is accomplished. It is to be found one of the many advantages of "The Century W.C.," one to which you do not refer, whereas in the ordinary form of flush-down closet, the discharge into the drain can be neither more nor less than the equivalent of the capacity of the 1½-in. down service pipe from the urn, in the "Century W.C." the syphonic discharge ensures an independent flush equivalent to area and capacity of a 3-in. soil pipe (which can be used without fear of stoppage), and continuing the much larger quantity contained in the drain as well as the contents of the cistern are ejected, and ejected with the increased velocity to atmospheric pressure.

These closets may be seen under the conditions of actual use in the new underground convenience the Strand District Board of Works, Wellington-st.

GEORGE JENNINGS.

# THE COMPETITION GUINEA.

As I find advertised in your issue of the 13th inst. a form of lottery, Archibuteus are invited by the North School Board to send a guinea to their office in return for which they will receive particular premiums, &c., for a competition. Having viewed them, one may find it worth while to send design, or the best thing to do may be to put particulars obtained in the waste-paper basket, however respectable the conditions may be, it does seem he can only get his guinea again by sending in a set of *bona-fide* plans.

EDGAR A. HAWKINS.

It is not a new practice, though of rather recent introduction. We have already more than expressed our opinion strongly against it, as architect cannot tell till he sees the conditions under which they are such as he would be willing to compete under.—ED.

NORTH BRIDGE, EDINBURGH.—Dr. Rowanderson, at the meeting of the Edinburgh Architectural Association on the 10th inst., in moving a vote of thanks to the Rev. Mr. Mylne for a paper to the Association, said that the North Bridge was considerable merit; but what had been done to the present day had not added to that merit. A helplessness production than the present North Bridge did not exist in the city of Edinburgh. In for a new bridge it was to be hoped that the art of architecture would not be kept in the back of the door altogether. If it were to be looked upon as a piece of engineering—a span to circle a river irrespective of everything else—it would be a misfortune to the city of Edinburgh. The occupied one of the most remarkable sites in the city. If the citizens did not insist upon a worthy of the reputation of the city could be a blot that would remain on the city for generations, and would stare one in the face. Mr. S. Henbest Capper, in saying, said the metal cantilevers of the North Bridge were not particularly effective, for whenever a large number of passengers were ordered to cross the bridge, the cantilevers would be perpetuated.

# The Student's Column.

## THE STRUCTURE AND PHYSICAL PROPERTIES OF BUILDING STONES.—III.

### TOUGHNESS AND BRITTLINESS.

BY the toughness of stone is meant the relative power of adhesion of its particles to one another, and their elasticity. It is a property essentially dependent on structure, but collaterally also on mineral composition. Brittleness may be described in similar terms, only that it is the converse of toughness. To a certain extent both represent different degrees of the same property, and are closely related to the character of hardness.

As an illustration of this we may remark that certain varieties of Purbeck stone are practically of the same hardness as some of the Portland group, yet in general terms the former would be said to be much more brittle than the latter, which in consequence are described as tougher stones. The cause of this is not difficult to understand when we know something of the microscopic structure of the stones in question. The Purbeck freestones are made up almost entirely of minute fragments of shelly matter in which cleavage structure is apparent, whilst the surfaces of the fragments are also points of weakness. The Portland stones, on the other hand, are made of minute, hard, oolitic granules firmly adhering to one another, and but little shelly matter occurs, whilst no cleavage planes or lines of weakness are observable. When the mason strikes the former class of freestone it is not difficult for him to disengage quite a large flake of the material with one blow of the hammer, the stone readily splits along the innumerable cleavage planes and free surfaces; but to sever a piece of stone of the same size from a block of the latter, many blows of the same force are required, and there would be a general tendency for much smaller pieces to come away, the firm adhesion of the oolitic granules, together with the homogeneity of the material and the absence of lines of weakness, cause it to be much tougher.

We do not imply, however, that a brittle stone is necessarily inferior in quality to a tough one; it may be that, from the point of view of weathering, the former may contain more durable minerals than the latter. At the same time, the purpose for which the stone was required would have to be largely taken into account. If delicate carvings had to be executed therein, no one would select a very brittle material for the purpose. For designs requiring breadth of treatment the character of brittleness would be no great impediment, whilst for ordinary ashlar it might practically be ignored. It should be remembered that the more brittle a stone is, the easier it can be toolled and dressed; for a stone to possess the attribute at all, it must in the first place be rather hard. It is the special features introduced by brittleness that cause variations in the relative cost of tooling certain rocks, and which render it difficult to draw up a perfect "scale of hardness," based on the relative facility of tooling, as explained in our last article.

Important though the relative toughness and brittleness of a stone may be from the point of view of its selection for certain building purposes, these properties have a much wider significance when applied to the choice of road-metal. We may ignore those kinds of "metal" of an earthy description, which every road-surveyor worthy the name knows to be utterly useless materials, and confine our attention to the more crystalline varieties. Toughness is, perhaps, the most essential characteristic of a good road metal, though durability of its component minerals is also highly desirable—especially for country roads. The class of stone used in a busy thoroughfare, however, is usually too short lived—too soon worn away by traffic—no matter what its quality may be, for it to be much affected by agents of decomposition. Take granite for example. As a whole, that rock is very durable, but it varies materially in the matter of toughness. If, for instance, we have one of an exceedingly compact nature, fine grained, the microscopic structure of which shows that its component crystals are intimately interlocked, or associated with each other, that will be a much tougher granite, and make a better road metal than one in which the crystals are larger, much cleaved, or twinned, and simply adhere to each other.

The character of toughness as applied to roofing slates is most important; if a slate is not

tough it is of no use. The stronger the slate, the greater its toughness, and the less its porosity. Landings and large paving stones also must possess this quality in an eminent degree.

The methods hitherto adopted of ascertaining the toughness or brittleness of building-stone are not very satisfactory; and but few tests for these properties have been carried out—at least in this country. In a somewhat exhaustive examination of the building-stones of the State of Minnesota, Professor N. H. Winchell gives\* the comparative facility of dressing the materials concerned, and he was able to state, as a result of his inquiry, that those elements in general which go to make up a very durable building-stone, and thus act affirmatively for the stone as a part of the structure, also go to make it incorrigible in the builder's hands, and to that extent act negatively. The tests for facility of dressing operated disastrously on the crystalline rocks, and wholly to the advantage of the softest ones. The variation in texture induced by lamination, or accompanied by it, naturally affects the toughness of many stones, particularly those of the sandstone class. Professor Winchell does not tell us precisely how he compiled his statistics relating to facility of dressing; we should have been glad of information on that head.

The toughness of slates is not a difficult matter to ascertain, though here, again, but few tests have been carried out by scientists. A method adopted in the United States which determines the strength, toughness, and elasticity of the material at one operation may be described as follows:—Slabs of slate 24 in. in length, by 12 in. in width, and ½ in. in thickness are supported in a horizontal position upon wooden knife edges 22 in. apart, the loads being applied upon another knife edge placed half-way between the supports. The ultimate deflection of the slate in the centre, just prior to its breaking, is then carefully ascertained, and the results give the toughness or elasticity of the material. It is obvious that for slabs, landings, and the like the toughness of the stone is practically coincident with its tensile strength, and we reserve further remarks on this head until we come to deal with that property.

### ABSORPTION OF WATER.

All building stones contain a certain quantity of water, some of which is inherent to the material as a chemical property, whilst some—by far the greater amount—has been imbibed by it temporarily. The latter soon evaporates after the stone has been quarried; or, at least, a very large proportion of it does. Stones vary considerably in regard to the amount of water they can absorb, depending on their structure and state of crystallisation. Whilst some absorb water rapidly, and transmit it freely, others imbibe it more slowly and retain the fluid for a much longer period.

A great number of tests to ascertain the ratio of absorption of water by British building stones have been carried out from time to time, and before criticising these we may profitably describe divers methods of arriving at the results. We desire to call the student's attention specially to this matter, as it has a direct bearing upon a considerable number of our own experiments.

Professors Daniell and Wheatstone show† the bulk of water absorbed by the stones when saturated under the exhausted receiver of an air-pump. They remark that the quantity of water absorbed in this process may be considered to represent the space occupied by the pores or interstices in the substance, unless we suppose that in some cases the adhesion between air and the solid particles is so great that the entire removal of the atmospheric pressure is not sufficient to counteract the force. It is certain, they state, that when this pressure is not removed, long immersion in water will not occasion the displacement of all the air contained within the pores.

Professor W. C. Unwin, F.R.S., says‡ that in the determination of the porosity of stone the specimens should be cubes, and well dried. They should be brushed, weighed, and then gradually immersed in water, remaining there until saturated. The stone will become nearly saturated in twenty-four hours, but it may, for certainty, be left in water for five days. It should then be taken out, carefully dried on the surface, and weighed. For strictly comparable results the specimens should be of the same volume and surface. In a series of experiments carried out under his supervision, 3-in. cubes of stone were

\* "The Geology of Minnesota," Final Report, Vol. I. (1874), p. 165.

† "Report on the Selection of Stone for Building the new Houses of Parliament," 1839, p. 36.

‡ "The Testing of Materials of Construction," 1888, p. 426.



used, and immersed in water for from seven to fifteen days.

Professor Wilber determined\* the percentage of water absorbed by dry samples as follows:—Specimens weighing about 50 grams were used. They were dried in an air bath to a constant weight at 212 deg. Fahr., and were then immersed in cold (previously boiled) distilled water, and after complete saturation, were removed one by one from the water, their surfaces quickly dried by blotting-paper, and were again weighed. The percentage gained in weight by the saturated sample was then computed:—

Per cent. gained =  
Weight of wet sample—Weight of dry sample  $\times 100$ .  
Weight of dry sample.

Professor T. Hudson Beare† used dried 2½ in. cubes, which, after being measured and weighed were lowered gradually into a vessel of water and left there for a period of six or seven days. At the end of that time the stones were taken out, wiped with a dry cloth to remove adherent water, and at once reweighed. The results are expressed as a percentage of the original weight. The water used for dealing with some of the specimens was derived directly from a water company's main without special treatment, whilst for others pure distilled water was employed. Professor Beare remarks that to be at all comparative, absorption tests must be made on cubes of the same size, and it is therefore not easy to compare one set of observations with another where this condition is not complied with.

Mr. Mansfield Merriman ascertained‡ the porosity of slates by immersing in water for twenty-four hours specimens previously dried at a temperature of 135 deg. Fahr., and noting the increase in weight.

So we see that none of these observers have adopted precisely the same methods in estimating the ratio of absorption of water: and none of the results are, therefore, strictly comparable with each other. It is important to bear that fact in mind in reading what follows.

#### OBITUARY.

M. CÉSAR DALY.—On the 11th inst. the death took place, at Wissous, his residence in France, of M. César Daly. He was born in 1811 at Verdun. His childhood was passed in England, but at the age of fifteen he returned to France, completed his education at Douai, and adopted architecture as his profession. He studied at Paris under Duban, who assisted him, in 1834, to establish the *Revue de l'Architecture et des Travaux Publics*, which he continued to edit till his death. He was the recipient in 1862 of the Royal Gold Medal of the Royal Institute of British Architects, and in the *Builder* for July 2 of that year some additional particulars will be found of his career. An article on his life and work will be found on another page of this issue.

AUGUST FÖLSCH.—Herr August Fölsch, whose works on theatre protection are so well known throughout the world, has just died at the age of sixty-nine. He was the first to take up the subject seriously, and to compile those invaluable statistics on theatre fires which are practically the only absolutely reliable data we have on this class of catastrophe. He first gave attention to the question of theatre protection in 1864, and at his first lecture on the subject, which was delivered at Vienna in 1870, he showed a list of forty-six theatres which had been destroyed. His memoirs, which he distributed among some of his friends in 1889, treated of 935 theatre fires, so that by this time the full thousand must also have been reached. Herr Fölsch's profession was that of a civil engineer, and as such he had an eventful career. According to his memoirs, he was born at Hamburg in 1824, and was first employed as engineer's apprentice on the Hamburg-Bergedorf Railway. From 1842 to 1852—i.e., just after the great Hamburg fire—he was engaged under Walter Lindley, who had charge of the re-modelling of the demolished city. He then obtained an appointment under one of the contractors for the Paris-Lyons-Mediterranean Railway, where he eventually became chief engineer. On the completion of this line he obtained an important post on the works for the Austrian Western Railway, and finally took up his residence in Vienna in 1859 as agent to the English contractor, Thomas Brassey. At Vienna he was also occupied with a project, which was eventually abandoned, for the better water supply of the city, and subsequently was identified with most of the Austrian railways built after the war of 1866, concluding with the difficult Vorarlberg line. In 1871 he was one of the engineers sent out to inspect the Northern Pacific Railroad by a group of European financiers, and his unfavourable report

was amply justified by the subsequent collapse of the undertaking. In 1872, on the conversion of Thomas Brassey's business into a limited company, he retired to Hamburg, where he resided until his death.

#### GENERAL BUILDING NEWS.

PROPOSED NEW SCHOOLS AT NEWHALL.—The Stanton and Newhall School Board are about to build a new block of schools at Newhall to accommodate over 1,000 children. Mr. Henry Beck, of Burton-on-Trent, is the architect.

CLUB BUILDINGS, DARTFORD, KENT.—A new Conservative Club has just been opened at Dartford. The frontage to the main street has four gables, with stone copings, &c., and under two of these are the entrances to the club, and to the covered way to the Conservative hall, which is in the rear of the club-house. The entrance-doors are of teak, with iron grilles, leading to a lobby, and a large hall, with staircase of pitch pine, and a panelled ceiling. The dining-room, 26 ft. by 18 ft., and the reading-room, 20 ft. by 18 ft., open from the hall; and behind is a billiard-room for two tables (with top lights and hot-water pipes), a steward's bar and lavatories, &c. The building will cost about 3,000l., and has been carried out by Mr. T. W. Haylock. The grates were supplied by Messrs. Barnard & Bishop, and the mosaic pavement by Messrs. Carter. The architect is Mr. A. J. Style, of Westminster.

CHANCEL SCREEN, PATSHULL CHURCH, STAFFORD.—The Bishop of Lichfield recently dedicated a screen erected in Patshull Church to the memory of the late Earl of Dartmouth. Mr. W. C. Banks, architect, of London, who effected alterations and additions to Patshull Church for the late Earl, designed the screen, and Messrs. Jones & Willis, of London and Birmingham, executed the work. The screen is of hammered iron of an ornamental design. It divides the chancel from the main body of the church, and is surmounted by a cross. The church itself, which is dedicated to St. Mary, an edifice of stone, in the Italian style, consisting of chancel, nave, north aisle, south porch, and a tower surmounted by a dome, and containing six bells. It was restored by the late Earl in 1874, when a new north aisle and vestry were added, and choir stalls and a new lectern and pulpit. The whole church was at the same time re-seated. Several stained-glass memorial windows were also placed in the church.

LADY CHAPEL, BRISTOL CATHEDRAL.—The Elder Lady chapel of Bristol Cathedral, which has undergone restoration, has just been re-opened. The stone has been repaired and cleaned, the paint carving and injured columns have been made good, and the floor has been taken up and relaid with a view to provision being made for heating. The eastern end of the chapel has been raised, and altar steps have been provided. The roof, which was in a broken and dangerous condition, has been made good, and the groining renewed where necessary. The old plaster has been taken off the stone work, and the whole has been pointed. The doorway on the north side has been built up. While this was being done, evidence was discovered that the doorway was inserted at a later date than that of the construction of the chapel. In the plan of the doorway the window opening it has been made the same size as the other windows, and the arcing has been continued. The archway opening into the north transept, which was in a dilapidated condition and shored up, has been opened. Messrs. W. Cowlin & Sons have carried out the work, under the direction of Mr. Pearson, R.A., the architect.

POLICE STATION BUILDINGS, SHREWSBURY.—The Mayor of Shrewsbury, Mr. W. Lyon Browne recently opened the new police station and offices which have been erected for the borough. The buildings are from the plans of Mr. J. Johnson, the contractor for the work being Mr. H. Price, a local builder. An office is provided for the Chief Constable, also a parade-room, five cells, and an office for the Inspector of Weights and Measures. Under the same roof are residences for the Chief Constable, the Chief Inspector, and one sergeant. The buildings are all of brick, with stone facings.

CATHOLIC SCHOOLS, HUDDERSFIELD.—The new schools which have been erected near Queen-street South, Huddersfield, were recently opened. One portion of the schools for the present forms a chapel, capable of containing 400 people, and thus arranged the whole available space can be occupied on Sundays, and give room for 600 people. The chapel is furnished with three altars, and lighted by stained-glass windows, the principal light depicting St. Joseph, in whose name the chapel is erected. The architect is Mr. Edward Simpson, of Bradford, and the builders Messrs. W. Radcliffe & Co. The total cost is about 2,300l.

TOWN HALL, COLNE, LANCASHIRE.—On the 13th inst. the new Town Hall at Colne was opened by Mr. Samuel Catlow, Chairman of the Colne Local Board. The new Town Hall is built of Yorkshire stone facings, backed with brickwork. The assembly-room is finished in oak, with open timbered roof. In the spandrels of the windows are leaded lights, with coats-of-arms and subjects illustrative of the trades of Colne. The floor is of

pitchpine boards, narrow widths. The staircase is of oak, and the entrance porch has a high dado and screen of oak. The clock and bells have been supplied by Messrs. Potts & Sons, of Leeds; and the heating arrangements have been carried out by Mr. Seward, of Lancaster. The contractors for the new building have been—stone and brickwork, Messrs. Hawley, Colne; joinery, Messrs. Riddiough & Co., Colne; plumbing, Mr. Binns, Colne; plastering, Mr. M. Haworth, Colne; slating, Messrs. Thornton Bros., Otley; painting, Messrs. Berry & Co., Colne. The original plans for the building, which has cost about 10,000l., exclusive of the site, were made by Mr. Mallinson, Surveyor to the Board, but the work has been finished above the ground floor level by Messrs. J. W. & R. F. Beaumont architects, Manchester.

NEW PREMISES FOR THE SOUTH WALES INSTITUTE OF ENGINEERS.—On the 12th inst. a new institute building for the South Wales Engineers, situated in Park-place, Cardiff, were opened. The new building is in the Renaissance style, and the material used in its construction is red brick with red stone dressings. It stands back about 30 ft. from the roadway, and has a frontage on Park-place of 66 ft., while the average depth of the building is 100 ft. The original plans for the building, which has massive iron railings and boundary walls, and a circular carriage drive will run up to the entrance doorway. Over the main entrance are representations of the arms of Wales and the arms of the borough of Cardiff in different panels. The work of erection was started in July, 1891, but was considerably delayed in consequence of the strike of the building trade. The hall of the building is 17 ft. by 33 ft., and 14 ft. high, and the floor mosaic, the in-laying having been executed by Italian workmen. The rooms on the ground floor consist of a secretary's office and writing-room, library and council-chamber (39 ft. by 22 ft.), a class-room, a lecture theatre (40 ft. by 42 ft. and 21 ft. high), with sitting accommodation for about 200 persons; lecturer's retiring-room, and suite of lavatories. There are two strong rooms, the basement, a room for the heating apparatus, and a museum room (54 ft. by 21 ft. 6 in., and 8 ft. 3 in. high). The second floor, which will be used by the South Wales Schoolmasters' Association, is ascended by means of a staircase, constructed of concrete and iron, encased in carved teak wood with elm treads. On the second floor is the sliding-scale committee-room, general conference-room, waiting and writing rooms, a room for the workmen's representatives on the sliding-scale, secretary's offices, a spare room, and suite of lavatories. The upper portion of the building will be occupied by the caretaker. The building is lighted by electricity. Messrs. Verity & Co., London, supplied the fittings. The rooms are heated by hot water. The architect of the building was Mr. Edwin Cowlin, of the Duke of Devonshire's Office, and the contractors, Mr. H. Wale, the clerk of works. The building will cost (including the finishing) about 10,000l.

BOARD SCHOOL, HURST HILL, STAFFORDSHIRE.—The memorial-stone was laid on the 8th inst. new Board Schools at Hurst Hill. Plans were prepared by Mr. A. P. Brevitt, architect, and the work has been given to Messrs. T. Jones & Son, builders. The building consists of two blocks, one to accommodate 200 children in the mixed department, and the other 150 infants. The school is built of red brick, with terra-cotta work, and Gornalston facings. They will be lined inside to the height of 4 ft. with glazed bricks. The floors will be made of wood blocks, and the rooms will be heated by Messrs. Shillito & Shorland's hot-air grates. Ventilation will be on the latest principles, and playgrounds are to be asphalted.

PROPOSED ENLARGEMENT OF THE FRESCOT WORKHOUSE.—The Guardians of the Frescot Union have decided to take steps forthwith to erect buildings for the accommodation of a large number of inmates over the present accommodation. Mr. G. Gandy, architect, St. Helens, is engaged on the plans.

PUBLIC CONVENIENCES, HYDE PARK.—The Vestry of St. George, Hanover-square, opened Tuesday the 16th inst. the public conveniences which have been erected in Hyde Park, close to the Marble Arch. The building, which is divided into two sections, for ladies and gentlemen respectively, partly underground, the section for ladies built above ground. This part of the structure is built of brickwork, faced, on the outside, with Portland stone, and on the inside with white glazed bricks. It contains eight closets and an attendant's room, and in addition there are a private lavatory with closet, and a so-called "public" lavatory with closet, but with two lift-up hand-basins. The plan is by Messrs. Minton & Co. The gentlemen's department, which is underground, and which has four entrances, contains 72 urinals, 24 water-closets, two attendant's rooms, two lavatories with six lift-up hand-basins in each, and a store-room. It is built of brickwork, faced, inside the building, with white glazed bricks. It is surrounded above ground level by a balustrade of Portland stone. The urinals are constructed of polished red royal marble with grating backs in white enamel and are flushed by the discharge of water from

\* *Ino. C. Smock*, "Building Stone in New York," Bull. N.Y. State Museum, Vol. I. (1890), p. 10.  
† "Minutes Proc. Inst. C.E.," Vol. CVII. (1892), p. 349.  
‡ "Stone" (Indianapolis), Vol. VI. (1893), p. 125.



as tanks fixed above them, the tanks being to discharge alternately, providing thereby constant flush. The flooring of asphalt, laid by Val de Travers, and the building is lighted by skylights. In both departments the electric light and gas are provided, the electric light being cut by the Planet Company. Bostwick folding gates have been used in the gentlemen's department, and in a backyard are two free closets—the only closets that have been constructed, for all the other closets, in both departments, are provided with skylights and the gentlemen's department. The drainage sanitary work has been carried out by Messrs. Laiding & Sons. The total cost of the works was £8,000, and the whole has been constructed by Messrs. Bywater & Sons, builders, from plans & specifications prepared by Mr. G. Livingstone, E., the Surveyor to the Vestry. Mr. D. Pratt is the general foreman.

#### SEWAGE AND ENGINEERING NEWS.

**CITY OF ROCHESTER SEWAGE.**—On the 15th inst., Major-General Phipps Carey, R.E., one of the Inspectors of the Local Government Board, held an inquiry at the Guildhall, Rochester, in reference to the application of the Town Council for authority to contract a loan for carrying out sewerage and sewage disposal works for the central portion of the district. The Town Clerk, J. Pratt, stated that a drainage scheme had been considered necessary in consequence of the mandamus being issued by the High Court of Justice, in the instance of the Local Government Board. The Town Council then applied to engineers for drainage schemes, and out of several received, had unanimously decided in favour of that prepared by Messrs. John Taylor, Sons, & Santo Crimp, of Westminster, and sanction to carry out which was granted by Mr. Santo Crimp, M.Inst.C.E., gave a general and detailed explanation of the proposed works, and said that the sewers would be laid in straight lines and at self-cleansing gradients; there would be man-holes and inspection chambers at each change of direction or gradients, and at all junctions of branch with main sewers. The system would be thoroughly provided with ventilators, and with automatic cleaning arrangements at suitable points. With regard to the method of dealing with the sewage, and of a highly suitable character for sewage purification could be obtained in the neighbourhood at a reasonable cost, but before applying the sewage to the land the "Wimbleton" system would be employed for the purpose of removing the suspended matters. Mr. Crimp had had a long experience of this system, and with certain modifications, rendered necessary by the new conditions, he could confidently commend its adoption. The "Wimbleton" system consisted of a combined settling-tank and trifling filter, and not only were nearly all the suspended matters removed, but some of the organic matter in solution was also broken up. As result large volumes of the partly-purified sewage could be applied to land without causing any nuisance, or injuring the crops. The system had the advantage also of reducing the sludge to a minimum, since chemicals were not necessary in the process. The Inspector visited the site of the proposed works, and will report in due course. There was no opposition to the scheme.

**SEWAGE WORKS, HOLFORD, NEAR BRISTOL.**—Colonel W. M. Ducat, R.E., the Local Government Board Inspector, held an inquiry at Holford on the 5th inst., with reference to an application from the Holford Local Board and Barton Regis Rural Sanitary Authority for sanction to borrow the sums of £9,700, and £2,870, for works of sewerage and sewage disposal for a portion of their districts. Mr. A. P. I. Cotterell, A.M.Inst.C.E., engineer to the scheme, attended and gave evidence, and stated that the works, as designed by him, consisted of sewers the Holford Urban and Barton Regis Rural districts, converging together to works proposed to be placed in a field where the sewage would be disposed of. About three acres of land would be reserved for disposal works. The system of disposal of the works had been designed was that of the International or Ferrozene and Polar process, and the Inspector said he felt the scheme was a good one, and that those who opposed would, by-and-by, look back upon it with satisfaction.

**SEWAGE WORKS AT WALSALL.**—The new sewage purification works for Walsall, which have been designed and carried out at a cost of £8,000, by the Borough Surveyor (Mr. R. H. Middleton), were commenced a few days ago by the Chairman of the Committee (Councillor J. Noake). The total flow of sewage to be dealt with is estimated at about 500,000 gallons in the 24 hours, and the position of the tanks is such that the effluent can be drained to the existing culvert and passed on to the low level area of the farm, as well as on to the middle and high levels, by means of pumps and the turbine, and on to the filter-beds. The raw sewage can also run directly on to the farm, but generally it is to be treated with aluminiferous and milk of lime, and then pass to settling-tanks. These are connected on the "continuous flow" system, and the effluent will pass into the effluent carrier or into the

filter-beds, while the sludge will gravitate from the tanks to a sludge-well and be pumped up to the sludge-beds. After being dried the sludge will be double dug into the ground. The contract for the tanks was carried out by Messrs. Cooke & Co. (Battersea), for the machinery by Messrs. Tangye (Birmingham), and for the carrier by Mr. A. G. Boys (Walsall).

#### STAINED GLASS AND DECORATION.

**WINDOW, MICKLEHAM CHURCH, SURREY.**—A three-light stained glass window has just been placed in position in the south aisle of Mickleham Church, Surrey. The subject is "Christ Blessing Little Children," and the window was designed and executed by Messrs. Percy Bacon & Brothers, London.

**WINDOWS, CITY TEMPLE, LONDON.**—Three large windows in the City Temple, Holborn, have just been filled with painted glass from the studio of Messrs. Charles Evans & Co., of London, W. One of them has been erected by subscription to commemorate Dr. Parker's one-thousandth Thursday morning sermon, and the subject chosen was "St. Paul preaching at Athens." The others illustrate "The Sermon on the Mount," and the Rev. I. De Kewer Williams. Each of the windows is surrounded by a wide border, and Classic canopies and bases.

#### FOREIGN AND COLONIAL.

**FRANCE.**—The Government has now decided to rebuild the store of scenery of the Opéra House and Opéra Comique on ground near the outskirts of Paris. Until that is ready, the portions of the Opéra decorations which have escaped the fire will be transferred to the Palais de l'Industrie.—M.M. Besnard and Lerolle have been commissioned to execute the cartoons for the windows of the refreshment-room for the Council in Hôtel de Ville of Paris.—The fire at the Chicago Exhibition played sad havoc with the French exhibits. Besides a number of products of manufacture, all the objects sent over from the national pottery factories of Sévres and Nevers have been destroyed. Fortunately the paintings and sculpture have escaped entirely.—A bronze reproduction of M. Charpentier's group, "Les Lutteurs," has been commissioned by the State for the town of Avignon.—The model for the monument commemorating the defence of the Saint Quentin has just been placed, by way of experiment, on the Place de l'Hôtel de Ville in that town. The monument is designed by M. Theunissen.—The works ordered by the Government for the embellishment of the town of Oran will shortly be commenced, M. Cayla being the architect.

—The Department of Fine Arts has commissioned MM. Bayard de la Vingtrie, Hermant, and Bogino, to model busts of Admiral Duperré, Horace Vernet, and Admiral de Gueydon. These are intended to decorate the Government palace at Algiers.—The town of Pezaris is about to erect a monument to Molière.—M. Auguste Louzier, an architect of great merit, has been appointed Chevalier of the Legion of Honour, among the New Year's honours. M. Louzier is diocesan architect for Coutances and Sens.—It is proposed to transfer the Paris observatory to an eminence situated between Vitry and Joinville. The Chamber of Deputies is to discuss in a few days the question of a loan of 117 million francs demanded by the Municipality of Paris for the diversion of the sewerage of the capital to the plain of Achères. It is expected that a counter proposition will be brought forward to carry away the sewage by a canal to the sea; a scheme which is estimated at 100 million francs.—Works have been commenced for the enlargement of the Pont de Neuilly, Paris, which is too small for its traffic.—It is proposed to build a consumption hospital at Castellaccio, near Ajaccio, in Corsica, on the site of the present penitentiary, which is to be destroyed.—The Municipality of Bordeaux has opened a competition for the pictorial decoration of the grande salle de fêtes of the Mairie of that town. The competition is to be decided in Paris, where the drawings will be sent.

The Government, in consideration of the immense number of artisans out of work, at present intends to undertake shortly the carrying out of some large works in Paris, partly with the view of finding profitable employment for a considerable proportion of the men out of work. It is expected that the preparation for the Metropolitan Railway will form part of these works.

**GERMANY.** The old Christ Church at Berlin, which has been under repair for some time, was reopened by the Empress last week. The alterations and repairs, which were carried out by Professor Orth, cost over 2,000,000.—The historical church of St. Mary, at Berlin, which has been lately undergoing structural repair, is to have fourteen new stained glass windows. Its fine old organ is to be repaired at a cost of about 1,000, and its two bells, dating from 1657 and 1720 respectively, are to be rehung.—An excellent perspective, showing the "Hofburg," in course of erection at Vienna, together with the two new museums lately completed in that city, has been exhibited at the Berlin Royal

Academy, in memory of Herr von Hasenauer. The deceased professor was an honorary member of this Academy.—Seven designs have been submitted for the annual Schinkel Competition, which is an improvement on the small number regularly received for some years past. The subject set was "Design for a large Club-house."—The extensive additions to the new Imperial Bank buildings at Berlin are now approaching completion. One of the chief features of the extension is the underground strong room, the walls of which are 3 ft. thick, and covered on the inside with glazed tiles. Room is provided in the gangways for two trolleys abreast. The room will be lighted by electricity and heated by hot-water pipes.—Professor Anton von Werner has been re-elected President of the Society of Berlin Artists, and Herr Schwenke, an architect, will be the secretary for the coming session.—The two competitions for the designs of two new Lutheran churches at Düsseldorf have been decided. The first premiums were respectively awarded to Herr Weidenbach and Herr Kappeler, both of Leipsic.—The Albert Theatre at Dresden which belonged to the Saxony Court, has been sold for 26,000. The Royal Theatre Administration will now only have charge of Semper's Opera House, which is to be used for plays as well as operas.—The new bridge which has been thrown over the Vistula, near Fordan, in East Prussia, has a length of 1,300 metres or about 4,264 ft. The bridge has a pair of rails for railway traffic, a carriage road of 20 ft. width, as well as two 5-ft. footways. Its purpose, is to a certain extent, military.—The well-known painter in water colours, Professor Karl Werner has died at the age of eighty-five. He was born at Weimer and studied at Leipsic and Munich. His Egyptian sketches have been, from time to time, exhibited in English exhibitions.

**SWITZERLAND.**—The Municipal authorities at Berne have for some years been making some successful experiments in the erection of cheap artists' dwellings on the "Wyerfeld" estate. The last Board of Works report showed that some fifty houses had been erected since the scheme was proposed in 1889, and that the ninety tenements thus provided had been let as soon as they were finished. The Municipality builds four types of houses, classified A, B, C, and D, the following particulars of which may be of interest. Those of class A cost about 2,080 fr. They are semi-detached and built of wood, the only objection raised to them being the smallness of the rooms and bad staircases. Class B, built of masonry, cost 4,000 fr., contain three rooms, and are free from the defects of class A. Class C contain the same number of rooms as class B, but larger, there being two tenements in every semi-detached house, each tenement costing 5,650 fr. Class D are similar to class C, but contain four rooms, costing 8,650 fr. per tenement.

#### MISCELLANEOUS.

**THE SWEDISH IRON, STEEL, METAL, AND COAL INDUSTRIES.**—From the report just issued on these industries in 1892 we learn that the production was as follows, the corresponding figures for 1891 being given in brackets:—Iron ore—353 mines—1,291,933 tons (985,255 tons); increase 31½ per cent., the largest quantity ever raised in one year; miners employed, 7,564; output per man, 170·8 tons (158·3 tons); pig-iron—135 furnaces—485,664 tons (490,913 tons); decrease, 5,249 tons, or 1 per cent., average output per furnace a year, 3,597 tons (3,676 tons), diurnal, 12·35 tons (12·23 tons); forged and puddled pig, 316,577 tons; Bessemer and Martin ingots, 146,155 tons, &c.; unwelded iron and steel, 395,897 tons (380,500 tons), of which Lancashire blooms 217,685 tons, or 92½ per cent.; Bessemer steel, 82,422 tons (92,985 tons); Martin, 76,550 tons (78,197 tons); decrease, Bessemer steel, 10,593 tons, or 11·4 per cent.; Martin, 1,641 tons, or 2·1 per cent.; bars, blooms, billets, hoops, nails, plates, rails, tyres, &c., 293,035 tons (280,430 tons). The production of other kinds of ores and metals was:—Gold ore, 3,463 tons, increase, 29·2 per cent.; silver, 19,803 tons, increase, 31·6 per cent.; copper, 24,069 tons, increase, 10 per cent.; zinc, 54,981 tons, decrease 10·7 per cent.; manganese, 7,322 tons, decrease 13·7 per cent.; gold (pure), 87,626 kilos, decrease 20 per cent.; silver, 5,210,640 kilos, increase 42·4 per cent.; lead, 798·6 tons, increase 167 per cent. (largest output on record); copper, 745 tons, increase 37·1 per cent.; copper ware, 313 tons, increase 1·7 per cent.; brass, 302 tons, increase 3 per cent.; coils, 199,380 tons, increase 0·7 per cent., of which 57·1 per cent. were "best," 33·74 per cent. "seconds," and 7·99 per cent. "thirds." In addition there were raised from the coal deposits 123,096 tons of fireproof clay, made into tiles, bricks, sewage mains, fine earthenware, &c., as against 134,000 tons in 1891. In the mining and metal manufacturing industry are employed 1,861 motors—steam and water—of 60,353 h.p.; 31,790 hands, i.e., 65·8 per cent. in the iron mines, 13·2 per cent. in the collieries, and 21 per cent. in other mines, of whom 671 were women, mostly employed in the iron mines. Of the latter, 188 were under eighteen years of age. In the mines 65·4 per cent. worked above, and 34·6 per cent. below ground. There were sixty-one accidents, twenty-seven being fatal.



Glasgow Architectural Association.—Paper by Mr. Stark entitled, "Some Thoughts on Architectural Design." 8 p.m.

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**POOL:**—For remaking the Queen's Grove-road, Parkstone, for the Town Council. Mr. Jno. Elford, Borough Surveyor, King-street, Poole..... £180 0  
W. Guy..... £180 0 T. C. Rigler..... £180 0  
C. T. Budden..... 187 0 W. Bristow (accepted)..... 187 0

**SWINDON:**—For sewerage, metalling, channelling, &c. private streets, for the Swindon New Town Local Board. Mr. H. J. Hamp, Surveyor, Regent Circus, New Swindon —

J. Williams, Victoria-street, Swindon..... £328 0 0  
H. J. Hamp..... £328 0 0  
T. Winchcombe, Wroughton-road, Swindon..... 55 0 0  
H. J. Hamp..... £328 0 0  
T. Winchcombe, Wroughton-road, Swindon..... 540 0 0

**SWINDON:**—For new Sunday-school, Swindon, Wilts.—  
Wm. Chambers..... £2,956 10 0 Geo. Wiltshire..... 2,175 0  
Thos. Barrett..... 2,215 10 0 Thos. Colbourne..... 1,840 0  
Chas. W. J. Bell, County Surveyor, The Courts, Carlisle.  
Quantities not supplied..... 1,760 15  
Thomas Telfer, Langport, Dunfermlire..... £263 0 0  
Surveyor's estimate, £250 0 0  
[All of Swindon.]

**WALTON (Cumberland):**—For the erection of a stone bridge over the River King, Dove Cote Ford, for the Brampton Highway Road. Mr. G. J. Bell, County Surveyor, The Courts, Carlisle.  
Quantities not supplied..... £263 0 0  
Thomas Telfer, Langport, Dunfermlire..... £263 0 0  
Surveyor's estimate, £250 0 0

**WOLVERHAMPTON:**—For the erection of an electric lighting station, Commercial-road, the Corporation. Mr. A. Paul Bennett, architect, Devonshire-chambers, Wolverhampton. Quantities by the architect.  
Henry Wilcock, Wolverhampton..... £4,985 0 0

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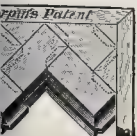
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# The Builder.

VOL. LXVI. No. 2669.

JANUARY 27, 1894.

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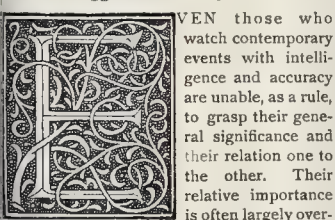
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### The Aggrandisement of Labour.



VEN those who watch contemporary events with intelligence and accuracy are unable, as a rule, to grasp their general significance and their relation one to the other. Their relative importance is often largely over-

rated or greatly minimised by those who, being close to them, scarcely realise their proportions. This has always been the case; the detachment of mind may to some extent be available, but it remains for the historian, who can view events from a standpoint removed from all prejudice, to weigh events so truly as to obtain a just result. Still it is always desirable from time to time to endeavour, however imperfectly, to view the currents of events in their real sequence, to ascend, so to say, some point above them, and thence watch their flow as does the traveller, who from a high ridge watches below him the currents of a great stream.

At the present time every intelligent observer has his attention constantly turned to something which touches on what is popularly called the labour question, the word "labour" being used in its primary and limited sense. At one moment it is a great strike, at another it is a Parliamentary conflict over the legal liability of employers for injuries received by their servants in the course of their service, at another it is the relief of workmen who, by reason of an intemperate season, or from other cause, are unable to earn their livelihood. Each and all of these subjects undoubtedly attract men's notice, but it is more than doubtful whether their relative connexion is appreciated. They all show the aggrandisement of labour. We use this short term because it expresses better than any other definition can do the present position of affairs. It indicates the composite character of events. It is not, for example, that we are face to face with one labour feature only, such as an organised attempt to obtain larger wages and shorter hours. In every grade of society, in politics and in business, the labour question presents itself, and under whatever form there is always evidence of its

aggrandisement, of its growth, of its size, of its power. It is no use to endeavour to evade the fact—it exists, and it is probably one which, when the history of the present century is impartially written, will be considered of the first importance. "Down to 1825," says Mr. McCarthy, in his "History of Our Own Times," "a mere combination of workmen for their own protection was unlawful; but long after 1825 the law continued to deal very harshly with what was called 'conspiracy' among working men for trade purposes."

We give this statement because it helps to emphasise, not only the difference between the position of workmen in regard to combination in the first and last quarters of this century, but it helps us to appreciate the extraordinary growth of this particular part of the labour question. Trades unions are now not only allowed to exist in peace; they have also become, as it were, armies of disciplined workmen, able and not unwilling to attack capital. In other words, trades unions have not only grown up in large numbers, but they have become so powerful that they are able to take the offensive. Further, they have become a political force. As was pointed out recently in these columns, the present Government oppose any clause in the new Employers' Liability Bill to allow workmen to contract themselves out of that measure, because they believe that by taking up this position they are acting in accordance with the wishes of the trades unions. Indeed, the whole of this Bill is a very striking instance of the aggrandisement of labour; it marks a distinct advance in the position of the workman; and so anxious were the Government to press it forward that they devoted part of a winter session to its discussion. If we cast our thoughts back for half a century—say to Sir Robert Peel's Administration in 1844, when Lord Ashley, as he then was, succeeded in getting the Factory Act of that year through Parliament—the extraordinary difference in the political power of labour becomes more evident. The Parish Councils' Bill is another measure indicative of this same aggrandisement; it is intended in principle to give the people of a locality the power of managing the affairs of their particular community by means of representative assemblies. But the majority of dwellers in any locality, whether it be

urban or rural, are generally—except, perhaps, in some parts of the western side of London—labourers in some way or other. In the country they are labourers of agriculture, in the town they are mechanics, or what may be termed shop people, but they form part of the great army of labourers as distinguished from pure brain-workers, and it is the former who will shortly be the chief power in this country, whether we look at them as choosing representatives in the Parliament at Westminster or in the local assembly which will manage the affairs of the village. In another respect the position of labour is remarkable. A system of Free Education now prevails throughout the country—the labourer can have his child educated without paying a single farthing. This is a striking instance of the aggrandisement of labour. It has a system of education to itself, if we may make a personal entity of it, for which it pays nothing. The Assisted Education Act of 1888, as it should properly be termed, has caused much discussion, and its results are yet imperfectly appreciated. But it would be a mistake to overlook the fact that it is one form of what we have termed the aggrandisement of labour.

Again at the present moment, and for some years past, large numbers of persons have been troubled as to the best means of dealing with and helping the unemployed. There are many who are interested in this particular question who do not trouble about Free Education, or about the liability of employers, though in truth these questions are all related. The relief of the unemployed labourer is simply one bit of the labour question, and it is an instance of the aggrandisement of labour, of the enormous space which labour occupies in the minds of men, that so much time, trouble and money are spent on this part of the subject. A certain number of years ago there was nothing like the interest which is now taken in this question; men have realised that the unemployed labourer must be considered just as much as the one who is employed. Thus, side by side with the growth of the power of combination, with the spread of the political influence of labour, has grown up the national desire to find some solution of the very difficult problem of dealing with the mass of unemployed labour. Another form of the same subject is



the question of how the aged poor should be supported. The poor are chiefly some part of the great body of labourers, and any measure by which some system can be devised which will make more tolerable the last years of the aged poor is neither more nor less than a measure to improve the condition of labour. So that if we survey the field of current questions, and if we look back over this ending century and endeavour to define the relative connexion of the various subjects of the day, we shall find that many of the most important point to the aggrandisement of labour—that is to say, to the way in which it overshadows all other questions and crops up in all sorts of forms and ways. It is very desirable to realise this, because we may otherwise quite misapprehend the future course of events. We may erroneously suppose that when we have found some solution of some such question as that of free education we have done with it; on the contrary, the aggrandisement of labour will push it forward in some way again, though in another form, before the public mind. Thus we have given the workman free elementary education. But the movement is now obviously growing to give him a proper technical training, and it would not perhaps be rash to prophesy that it may be the lot of some future Minister of Education to bring in a Bill to establish technical schools supported by the community, at which men may learn some trade without payment.

We can see no reason to suppose that in the coming century any question will have larger national importance than that of labour, and its aggrandisement will probably strike the watcher of events in 1950 just as much as it does the observer in 1894. Its effects upon the fate of this country in all sorts of ways must necessarily be momentous; but we shall, however, be better able to forecast the probable course of events, if we endeavour to realise, however imperfectly, the composite fact which we have defined as the aggrandisement of labour, and how it is involved in and mixed up with a number of questions, which many are apt to regard by themselves, as if they were isolated from others, ignoring their general connexion and the way in which they all form parts and evidences of this striking phenomenon. We may view some features of it with satisfaction—the improvement in the material prospects of the workman and his relatives, their higher mental standard and the decrease of crime. But on the other hand it is not so satisfactory to recollect that the hand will now rule the head, and that labour, like fire, though a good servant may be a dangerous master. But these observations lead us into considerations which cannot be discussed here; we have sufficiently indicated the great importance, now and in the future, of the present aggrandisement of labour.

#### AUSTRALIAN NOTES.

**A**USTRALIA has fallen on evil times, and building is almost at a standstill for the present in its chief cities; but there are, nevertheless, a few works of importance in hand, three of which are due to the enterprise of our American cousins, who seem to have full confidence in the recuperative power of the Colonies, whatever the British investor may think. The Equitable Life Assurance Company of New York purchased a year or two ago very fine sites both in Melbourne and Sydney, and are now erecting thereon very costly buildings at a total outlay, including the sites, of over half a million sterling. The company sent over its own architect, Mr. Raht, who has already erected buildings of similar character in some of the European capitals, as well as in the States. American influence is, therefore, very apparent in the design of both buildings.

The Melbourne building is a trabeated design of a very bold type with Italianised

details, but as it is yet unfinished, and is much hidden by massive scaffolding, its effect can hardly be judged at present. The most interesting feature so far is the American system of steel construction adopted in the interior. The columns or stanchions are built up in sections, and are continuous from top to bottom, the girders resting on brackets bolted between the flanges of the column sections.

The Sydney building is of a different architectural character, a very bold and even coarse treatment in American Romanesque having been adopted. It covers a space 93 ft. by 100 ft., and is 115 ft. in height above the pavement. The centre of the front facing George-street is recessed about 5 ft., and a huge semi-arch 40 ft. in width spans the recess, and covers the two lower stories. The actual entrances are in the wall behind. Above the arch is a screen of two polished red granite columns, and two small pilasters carrying three semi-arches. The whole composition is divided into four well-marked portions. The two lower stories form a fairly solid basement and mezzanine, a band of dark polished stone cutting it off from the lighter pier and arch treatment of the next three stories. The topmost story is decorated with polished columns, and forms a broad frieze to the whole structure, a boldly-projecting cornice crowning the composition.

Of course, the object of the Association in erecting such costly structures on such costly sites is advertisement, but advertisement of a very expensive kind, for it is much to be feared they will never return in rental during the present generation a fair percentage on the outlay. They afford, however, fine object-lessons in sound building, and suggest one or two thoughts from a critical point of view. Why, for instance, did the architect choose a rugged type of Romanesque for a bright and sunny climate like that of Sydney—where frost is unknown—and adopt the Italianised detail in Melbourne, which has a winter more like that of the South of England? It almost seems as if the question of suitability to site and climate had been ignored, and the matter decided by what would most strongly contrast with the existing buildings in each city. In Sydney, exactly opposite, is the ornate habitation of a local Life Office, and hard by are the long lines of the Post Office, both Renaissance in design, and typical of the prevailing style. In Melbourne almost all styles have been tried, but arcuated design is very prevalent, so a trabeated composition of a very bold type would most easily crush its rivals, many of which are exceptionally refined and artistic. While this competition exists, fine street architecture, as a whole, is impossible. Then the immense arch and screen of columns in the Sydney buildings is simply a *tour-de-force* for effect only, as it serves no practical purpose—indeed, it wastes valuable space, and spoils the light of several of the windows in the true wall behind. Really the most satisfactory part of this building is the side front to a lane, which is simple in composition and dignified in treatment, and it is a pity that sooner or later it will be hidden, as soon as the vacant lots facing the Post Office are built over.

The system of steel construction employed in both buildings is novel to Australia, though common in the States, and has much to recommend it, but unfortunately there are at present no foundries or rolling-mills capable of turning out such work at anything like the price of the imported article, and it is only in a very large building that the time required to send drawings home and get the work made and sent out could be afforded. So for the present this system does not stand much chance of general adoption.

The third building due to the enterprise of our American cousins is one almost as large and costly as the foregoing, the lower walls of which are just beginning to appear above the hoardings around the site opposite the Post Office in Sydney. It will be some months ere any judgment can be formed as

to whether it is likely to be worthy of its magnificent position.

The varying styles of architecture in Melbourne have been referred to above, and one or two comparatively recent examples may be noted. Foremost of these is the New Stock Exchange, a very florid example of Early Gothic, seven stories in height above the street line, with a high-pitched roof crowned by a very ornate fleche. The most marked features of the front are the three lofty arches covering the two lower stories, the wall of which is recessed several feet to permit of good light and access to the basement. Above is a slightly-projecting square bay, and a central and two small side gables finish the composition. The detail is very fair, and shows a much better acquaintance with the style than is common south of the line, but it is terribly overdone. There is no rest for the wearied eye amidst the multitude of shafts and pointed arches, crockets, finials, diapers and carving, and with half the outlay a better effect could have been produced.

On the other side of Collins-street are the new premises of the Commercial Bank of Australasia, won in competition by Mr. Lloyd Taylor, F.R.I.B.A. The exterior shows the same desire that we notice in the Equitable building, to crush competition by very bold treatment, and the general scale is therefore exceedingly large. There are only two divisions; a basement comprising the ground and mezzanine stories, and one immense order above embracing four stories, a fifth having its windows in the frieze. The Corinthian columns of this order are no less than 5 ft. in diameter. There are subordinate orders to the second and third stories, and also several of the individual windows, but the most objectionable features are the cantilevers of the fourth story supporting the large overhanging architrave of the entablature. They are constructively necessary, but are by no means beautiful. The building, however, is remarkable for the really fine octagonal domed banking hall, 60 ft. in diameter, a veritable Temple of Mammon. A plain dome would have been crushing, so intersecting ribs, richly panelled, are thrown across from column to column, embracing three sides of the octagon, as in Mr. Emerson's clever design for Liverpool Cathedral, and very stilted lunettes are formed in each bay, in which there are ornate triplet windows, with columns and entablatures all complete, to afford light and ventilation to the space below. In addition there is a large glazed lantern, so light and air will not be lacking, but whether the acoustics will be equally satisfactory is quite a different matter.

Another result of competition is to be seen, near this—viz., the premises of the National Mutual Life Association of Australasia. Externally it cannot be called a success, for it is a mixture of Early and Late Gothic forms suited to modern needs by openings of normal size fitted with double hun-sashes of the usual type. The fine brownish-yellow colour of the stone, specially imported from Sydney, is its chief merit.

There are several other Gothic buildings, of more or less recent date, and some very good, both in composition and detail, but all subsequent to the premises of the English and Scottish Bank, a very good example of Domestic Gothic erected about eight years since. It is curious how one successful building will set a fashion in a style unsuited to the climate, and it will be curious to note whether the Romanesque Assurance building in Sydney will have the same effect, or whether its unsuitability to the climate will be deterrent. The work of Mr. Vernon, the new Government Architect in that Colony, which is now beginning to evidence itself, is, on the whole, more likely to have a permanent influence, as it shows a natural treatment of materials and study of climatic conditions.

A rather important work has just been completed and opened for public use, in which an attempt appears to have been made to meet local conditions of climate and materials. This is the "Thomas Walker



Convalescent Hospital," situated on a promontory at about the prettiest part of the Parramatta River, near Sydney, and designed by Messrs. Sulman & Power. A large sum of money was left by a wealthy merchant for the purpose, so although there appears to be no waste, the planning was not cramped by lack of means. The principle adopted is the subdivision of the whole institution into blocks, so that there is a free current of air around each retaining covered communication, secure from wet and wind, but open to the atmosphere. The administrative block occupies the centre, and the men's and women's pavilions on each side are connected therewith by "cortiles" which have a fountain in the centre of each, and are rendered gay with bright flowering plants and shrubs in the Italian fashion. The whole design is based on the more simple forms of Italian Renaissance to be found in country places, and the wide overhanging eaves and green Venetian shutters keep up the feeling. This building may also have some influence on the development of style in Sydney, as already it has been much sketched by students, especially two very picturesque features, the Land and Water Gates, the latter of which stands out in the waters of the river, with a floating pontoon in front of it as a landing-stage.

Although Australia is depressed just at present, and more buildings such as the foregoing may not be erected for some years, the time will certainly come again when, with increasing knowledge, they will be equalled and excelled.

## NOTES.

It is understood that the draught of the London Streets and Buildings Bill is to be subjected to a careful revision before the Bill is brought in. Immediately after the opening of Parliament, in the second week of February, we may expect to see it in the form in which it is to challenge the opinion of legislators and the building world. In a Bill of that kind, almost every detail needs as much care as the main principles of ordinary measures. Each detail will affect a very large number of buildings, the interests of thousands of owners of property, and of hundreds of thousands of the dwellers therein.

In reference to the St. Helen's Technical School competition, to which we have already alluded, we have received from the Hon. Secretary of the Manchester Society of Architects a copy of the following resolution, passed at their meeting on the 23rd:—

"That the Council, having perused the copies of the correspondence which has taken place between Messrs. Woodhouse & Willoughby and the authorities of the St. Helen's Technical School, regret that, contrary to the assessor's award, the Committee should have decided to allow the authors of the second premiated design to carry out the work in preference to the authors of the first, a decision which they consider to be opposed to the true spirit of competitions."

"That copies of the foregoing resolution be sent to the R.I.B.A. and the various allied societies, and to Messrs. Woodhouse & Willoughby."

As we have already pointed out, the committee concerned in the matter were acting entirely within their rights, they having reserved to themselves the right to carry out any design, in a sentence which was included in the conditions issued to architects. If architects disapproved of that condition, why did they compete? To enter into a competition under a condition which was clearly stated at the outset, and then to accuse the committee of bad faith because they have acted upon it, is an illogical proceeding which we fear is not calculated to benefit the architectural profession in public estimation. While on the subject, we may correct an inaccuracy in our "Note" of last week, in which the sentence "They" (*i.e.*, the committee) "have made a mistake" should have

read (as the context would imply) "They may have made a mistake," the word "may" having been accidentally dropped.

AFTER two adjournments the inquest on the death of Frederick Ball, who was killed at the Blackfriars station of the London Electric Supply Corporation in September last, has been concluded. The jury returned a verdict of "Accidental death," and added, "We are of opinion that had the men been provided with gloves the danger might have been averted. We also think that the rules and regulations at the station should be printed, and that the second man should have been more competent before undertaking the work." The details of the sad accident have appeared in the *Times* and elsewhere; there is little or nothing to be learned from them, nor will the well-intentioned suggestions of the jury do much towards preventing such accidents in the future. The public seem to think that indiarubber gloves are a panacea against all possible electrical evils, and when a fatal accident occurs the Supply Company is invariably blamed because such gloves were not being used by the victim. Now at Blackfriars the voltage on the high tension side of the transformer is 10,000. To afford effective protection against 10,000 volts, the gloves would have to be something like an inch in thickness. No workman would, or could, work with his hands encased in such insulators. For the protection of the corporation the rules might well be printed, but anyone accustomed to workmen knows that, though an attendant might read them through when first engaged, he would very soon get into the routine of the station and forget all about the rules when anything exceptional happened. It is useless to tell a workman that if he does a certain thing he may get hurt, he will only take precautions if he knows that he will get hurt. Major Cardew suggests that a red lamp should be fixed to give warning when the current is on, but there are difficulties in this. Far better is the suggestion that a special form of vacuum tube should be attached to the high tension mains; not one, for that might break, but many. When these tubes glow everyone would know that to touch the main means death, or at least injury for life, and not even the most casual would neglect such a warning. The last part of the suggestion must have been due to misapprehension on the part of the jury, for the second man was injured while obeying the orders of his superior.

THE case of Hoyle & Co. *versus* the Assessment Committee for the Oldham Union, which was decided last week by the Queen's Bench Division, will be poor reading for manufacturers in these days of strikes. A strike occurred in the cotton-spinning trade for several months, and it was contended by the applicants that some reduction on the rateable value of the mills should have been made on this account, since during this period they were not working concerns. But the Court would not accede to this view, which in their opinion would upset the whole principle of rating. Undoubtedly this is a sound decision, nor do we think it would prevent an assessment committee from taking into consideration the probability of strikes as an element in the general value of the mills. That is to say, a hypothetical tenant would give less for a building if the trade carried on there was liable to constant interruption. But that is a different thing from reducing the rateable value because during a particular period business was stopped by a particular strike.

M<sup>R</sup>. WALTER BESANT recently complained that private individuals have ceased to endow almshouses, and pointing out that in London there are no new private ones, he observes:—

"No form of benevolence would seem more attractive; the money invested is not spent and

forgotten; it goes on bearing fruit from generation to generation. . . . Let us have more almshouses."

Several have disappeared of late years in London: and we understand that it is proposed to remove one of those at Tottenham. Commonly known as "The Spaniard's," the charity was founded by Balthazar Sanchez, under a charge upon his Stone Leighs property there, and has been since increased by the Cooke and the Beachcroft bequests. A house for four men and four women was built in 1596 on the Seven Acres, at the north end of the town, fronting the high road, near Scotland Green; the illustration in Dr. Robinson's "History and Antiquities of Tottenham," 1840, vol. ii., shows it as having but one story, and with large forecourts. In 1840 the trustees made some alterations for the comfort of its inmates. The founder, a native of Xeres, came to England in the train of Philip of Spain, as that Prince's commit-maker or confectioner. Having lived for awhile in a house, afterwards the "George and Vulture" inn, Tottenham, he died 1602, and was buried in St. Mary Woolchurch-haw Church, which stood next west of No. 1, Lombard-street. The inn, pulled down in 1830 and rebuilt, was erected *temp.* Elizabeth, and at the demolition many silver coins of the sixteenth and seventeenth centuries were found. It bore date 1587.

THE *Transactions of the Society of Engineers* for 1892, edited by Mr. G. A. Pryce Cuxson, Secretary, contain useful papers, well illustrated, dealing with—(1) electrical traction and its financial aspect, (2) the application of electricity to hoisting machinery, (3) dry crushing machinery, (4) sewage precipitation works abroad, (5) the cleansing and ventilation of pipe sewers, (6) the use of steel needles in tunnel driving, (7) the Shortland and Nunhead Railway works, with special reference to bridge crossings, and (8) an obituary, containing, among other notices, a valuable memoir of an honorary member, Sir George B. Airy, late Astronomer Royal. One of the leading features in the work of this Society, provided for the benefit of all members, is their inspection of various works in progress, forming vacation visits, among which, are described in the volume before us: The South Metropolitan Gasworks, the Tower Bridge works, the Kingston sewage works, the Hampton station of the Southwark and Vauxhall Waterworks, Messrs. Willans & Robinson's works at Thames Ditton, and the Great Eastern Railway Locomotive and Carriage Works at Stratford. With such variety, the quotation from Sir Robert Rawlinson, given by the President, Mr. J. W. Wilson, of the Crystal Palace School of Engineering, in an able inaugural address, and printed in this volume, appears to have been acted upon. Sir Robert Rawlinson stated "that a young man entering the profession should not at first endeavour to determine as to which branch of it he should follow, but should devote, say, the first two years to a careful grounding in theoretical and practical work generally; thus avoiding working in a groove from the outset, and preparing himself for a wider grasp of his profession and ensuring a possibility of his following successfully whatever branch he may then feel best fitted for, or which may then present itself to him." The index to the *Transactions*, 1861 to 1892, furnished at the end of the volume, cannot fail to prove useful for reference.

THE *Journal of the Franklin Institute*, for December, contains a paper on "The History and Modern Development of the Art of Interchangeable Construction in Mechanics," in which the author shows that conspicuous uniformity resulting from the duplication of parts in a machine, does not necessarily imply poverty of design, but rather gives evidence of successful adaptation in the fitness of all the parts for their



separate purposes. The author alludes to the general idea of a wheel dividing and cutting machine as first suggested by Dr. Hooke, and the subsequent development of a dividing engine by Jesse Ramsden. He considers that although the mill machine for small work is more generally used in America than in other countries, it is deserving of more extensive application in large work. The guide screw, and in fact the whole structure of a lathe, have, by their assistance in the production of exact work, contributed in no small degree to the art of interchangeable construction. We fully endorse the remark that "the study of the laws of success is always assisted by an investigation of the causes of failure."

IN announcing the recent demolition of Wordsworth's room in St. John's College, Cambridge, the *Academy* says that the window has been preserved, and that two of the Fellows have filled it with stained glass, bearing a memorial inscription. The room was taken for an enlargement of the College kitchen. In Book iii., "Residence at Cambridge," of "The Prelude," the poet writes:—

"The Evangelist St. John my patron was;  
Three Gothic courts are his, and in the first  
Was my abiding-place, a nook obscure;  
Right underneath, the College kitchens made  
A humming sound, less tuneable than bees.

Near me hung Trinity's loquacious clock,

Her pealing organ was my neighbour too;  
And from my pillow, looking forth by light  
Of moon or favouring stars, I could behold  
The ante-chapel where the statue stood  
Of Newton with his prism and silent face,  
The marble index of a mind for ever  
Voyaging through strange seas of Thought,  
alone."

The kitchen stands in the south-west angle of the first court, built 1511-20, which, until the building of the second court (1593-1602) formed the entire College buildings. (See Hammond's map of 1592.) Between St. John's and Trinity is a lane, against which stands the chapel of the latter, built in 1555-64. Roubiliac's statue of Newton was presented by Dr. Robert Smith, Master of the College, in 1755. It is an idealised portrait, and beautiful as it is, inspired a well-known living writer to ridicule it as showing Newton apparently absorbed by the discovery that you cannot see through a plaster prism. We may here mention that the committee who undertook to purchase and maintain Dove-cottage, at Townend, Grasmere, successfully accomplished their purpose about eighteen months ago. The house and garden have been carefully repaired and tended, and as far as possible restored to what they were when visited by Coleridge, Southey, and De Quincey. Some personal relics of the poet and his sister are added to the collection.

AN art exhibition is being held at Berlin, consisting of works of living Associates and honorary members of the Prussian Royal Academy, who are in general very well represented. The architectural contribution is the only unsatisfactory one, the few exhibitors, moreover, having only shown us old designs. Professor Schwechten exhibits a model of the great memorial church to Emperor William I. Messrs. Bruno Schmitz & Griesebach also show some church work, whilst Professor Ende (Ende & Boeckmann) exhibits some of his Government buildings in Japan, and Messrs. Kayser and Von Grossheim are represented by the yet older competitive design for the Hamburg Town Hall. Mr. Herkomer's new picture for Landsberg is the great attraction of the exhibition. Sir Frederic Leighton, Sir J. Millais, Mr. Tadema and Mr. Oules are re-

\* The court's south side was altered by Essex in 1772: the authorities decided to cover it with ashlar. In a contract made August, 1598, for the second court, between them and Ralph Symons, of Westminster, and Gilbert Wigg, "free masons," the "making up" of the kitchen is cited. (A.R. 3.)

presented. The exhibits are well hung in the three central halls of the old Academy building, the necessary arrangements having been made by Herr Paul Wallot, whose Houses of Parliament we described on the 6th inst.

THE exhibition at the Grafton Gallery includes a collection of a good many of the pictures and many of the studies of the late Mr. Albert Moore. Among the pictures are some which will be familiar in the memory of many as among the ornaments of former picture exhibitions, though the collection perhaps hardly includes the artist's finest work in figure pictures. The studies are of the greatest interest. We have here the first outline studies for the figures in many of the painter's best works, as well as a good many small figure-drawings made simply as studies. There is an atmosphere of pure art—*l'art pour l'art*—in the Gallery in which these works are collected, which forms a refreshing escape from the contentions of everyday life. On the other hand one must be conscious of a certain superficiality of feeling pervading these works, in which expression and soul seem absolutely wanting; the figure, in a decorative sense, is everything; the countenance, and the mind to be expressed in it, nothing; none of the figures have any character; they are simply figures beautifully drawn, beautifully draped, beautifully coloured (in the case of the finished works), but, as Byron put it—

"So coldly sweet, so deadly fair,  
We start—or smile—is waiting there."

This is hardly the last word of Art, the sum of what painting can do; but it is charming, no doubt, as far as it goes. The remaining contents of the Gallery are rather heterogeneous both in style and in artistic value. M. Aublet's "July," which we noticed in the *Champs des Mars Salon* of last year, fills the top of the Music-room, but loses a good deal by being hung in a recess and in a full light. There are two good portraits by Mr. Lavery, one, "Le Soir," a lamp-light study of a half length of a lady, very powerful in style but rather heated and overpronounced in colour and in the effect of artificial lighting. The large decorative panel by Mr. L. Welden Hawkins (75), "It is More Blessed to Give than to Receive," a decoration for a white room, is suitable in that sense; its allegorical meaning is somewhat obscure. Mr. Whistler has been making "impressions" of rough sea under conditions of light which render the water very dark, with some power of effect. There is a good deal to look at among the various works exhibited, and a good deal to wonder at.

THE second collection of drawings by Miss Kate Greenaway, now exhibited at the Fine Art Society's Gallery, is as pretty and interesting as the first, though of course it is an art with very narrow limitations. It is child-life translated into a kind of decorative form, with great grace of line, a great deal of pretty and fanciful humour, and a pure harmony of colour in the costumes. There are a few pictures of cottage scenery and figures seen in the natural light of day, which are pretty, but hardly of any remarkable quality. The most noteworthy work, in an artistic sense, is the water-colour drawing, on a larger scale than usual with the artist, of a "Boy with a Basket of Apples" (92) walking across the foreground in front of a landscape, which we noticed before in the Institute of Water-colour Painters' exhibition, and which has a remarkable poetic suggestiveness. Some frames of small designs which come last in the list, "Illustrations to Mavor" (117 to 120), are interesting as showing us the author's characteristic child figures in outline only, without the rather conventional colouring which in a certain sense detracts from the nature and reality of most of the drawings. It must be remembered, of course, that these

drawings were all (or nearly all) prepared for reproduction in chromo-lithography, which accounts for the flat and rather mechanical method of colouring employed. Some black and white drawings by Mr. Alfred Parsons, exhibited in another room at the same Gallery, are the originals of drawings which have appeared chiefly in some of the American magazines. Many of them are perfect examples of brush work in black and white, in the way of slight sketches of scenes in town and country.

IN last week's issue we published the list of tenders for the new Montpellier Baths at Harrogate, with the addition (as it was sent to us), "Mr. S. Stead, Surveyor." As we knew that the architects of the building (illustrations of which we published some time since) are Messrs. Baggallay and Bristowe, we were surprised to see this name attached to the list instead of theirs, and concluded that the Borough Surveyor had prepared the quantities. We have been since informed, however, that he did not, and that he had nothing to do with the matter except handing the quantities to the contractors and forwarding the list of tenders to us, with apparently due care that his own name should appear prominently in connexion with the work. This looks like the beginning of another case like that of the irrepressible Borough Surveyor of Carlisle, and had better be checked at the outset.

#### THE ARCHITECTURAL ASSOCIATION.

THE sixth meeting for the present session of this Association was held on the 19th inst. in the Meeting Room of the Royal Institute of British Architects, 9, Conduit-street, Regent-street, the President, Mr. E. W. Mountford in the chair.

The minutes of the previous meeting having been read and confirmed, the following gentlemen were elected members of the Association: Messrs. H. Astley, J. C. N. Clift, F. T. Flint, G. H. Paine, and A. H. Roe.

Mr. F. T. W. Goldsmith, the senior hon. sec., announced that a vacancy had occurred on the General Committee, caused by the resignation of Mr. H. O. Cresswell.

The President said that the Committee proposed to nominate that day fortnight the name of Mr. F. H. Prynne to fill the vacancy.

Mr. Goldsmith also announced that Mr. Alex. Beazeley, the Librarian of the Royal Institute, desires to obtain copies of the "Brown Book" of the Association for the years 1859, 1860, 1862, and 1866. If any of the members had in their possession such copies, and would kindly part with them for the benefit of the Association and the Institute, Mr. Beazeley would be indebted to them.

#### The Education of Workmen.

Mr. Owen Fleming said that he stated at the last meeting that the Committee desired to consider the resolution which stood in his name with regard to the technical education of workmen. Since that meeting he had had an opportunity of conferring with the Committee, with the result that the resolution had been amended in the following form:—"That it be referred to the General Committee to consider and report, as soon as possible, if, and in what manner, the Architectural Association can usefully exert its influence towards the organisation of a more thorough system of education than at present exists for artisans engaged in the London building trades, and its future supervision by architects." He quite agreed with the amendment as amended, and as he had been so fortunate to secure the unanimous approval of the Committee, he did not think that he need occupy the time of the meeting by giving any reasons beyond those he gave on December 8. He begged formally to move the resolution he had read.

The President said that since the last meeting the Committee had unanimously, after considerable discussion, decided to form the committee, which Mr. Fleming requested. It was merely a committee of inquiry, and after the inquiry had been made, a report would be brought before them.

#### Wood-carving, Practically Illustrated.

Mr. J. Raymond then read the following paper on "Wood-carving."

It was with much diffidence that I accepted the

kind invitation of your Committee to read a paper on Wood-carving to you this evening.

I felt that it could have been placed in abler hands, but at the same time thought that I might place some facts and thoughts about Wood-carving before the students of this Association, which, together with the practical illustrations, models, drawings, &c., before us, would prove both interesting and useful to them. Many facts that seem commonplace and elementary would no doubt be new to them, and my paper is, therefore, more particularly addressed to those who are studying for their profession, than to architects in practice.

The craft of the wood-carver is of great antiquity; Egypt furnishes the earliest examples. To its dry climate, and the care they bestowed on the preservation of the dead, we owe much of our knowledge of ancient work.

In the British Museum are fragments of the wood coffin of Men-kau-Ra, a king of the fourth dynasty, and builder of the third pyramid of Gizeh, B.C. 3,600, which has incised hieroglyphics on the face of the wood executed with much skill. The gilded wooden coffin of An-antef, a king of the eleventh dynasty, about B.C. 2,500, has the portrait carved in bold relief on the lid, showing great ability of treatment. A wooden figure of Rameses II., from the doorway of his tomb at Thebes, compares very favourably with work of a much later and more modern period. There is also a statue of another king of the same dynasty in the collection. The examples of mummy cases for animals, notably those for the sacred cats, some carved furniture and animals used for toys, are all very interesting as specimens of ancient wood-carving.

The treasure-house known as South Kensington Museum contains a wonderful collection of wood-carving of many periods and climes; Scandinavian and Norwegian interlaced work of the tenth and eleventh centuries, bold and vigorous in its treatment; some wooden shafts formerly supporting an organ, of curious South Italian work; about the thirteenth century; whilst examples of the fifteenth and sixteenth-century work abound, some of which we may note at random.

The very fine oak doorway of the council chamber, Oudenarde, one or two panels from which are sometimes copied and placed by themselves in a wilderness of plain surroundings, giving a starved effect utterly different to the rich massing of ornament so conspicuous in this and other examples.

The exceedingly bold treatment of the overmantel of chimney-piece from Bruges is worthy of notice.

The altar stall from St. Denis is extremely light and fine in its detail.

The boldly-carved doors with elaborate canopies and carved statues from the portal of the Cathedral at Aix, in Provence.

The sedilia of Ulm Cathedral is one of the finest examples of South German carving.

Whilst the examples of furniture, cabinets, frames, carriages, and screens are so numerous that we must pass them by. They are accessible to all, and the humblest craftsman can avail at leisure there the finest specimens of his handicraft.

The panelling from a room near Exeter, 1600, is worth noting, while the collection of English work of the seventeenth and early eighteenth centuries is becoming very large, and contains many very fine examples. Some capitals from Drapers' Hall show the method then in vogue of building up the work.

Our own churches and mansions contain fine examples of wood-carving in screens, stalls, roofs, &c., from the fourteenth century, through the Elizabethan period to the time of Grinling Gibbons, whose examples of unparalleled technical and artistic skill are to be found scattered throughout the country, also in St. Paul's and many of our City churches. It was our good fortune to have an opportunity of studying the carving in the choir of St. Paul's a short time ago, for a room we were carving in the style.

I only wish that the choir were more accessible, for it is a perfect mine of wealth in design and execution for the wood-carver.

Gibbons died in 1721, but his school influenced wood-carving down to the middle of the eighteenth century.

Country and town houses abound with acanthus carvings to doorways, chimney-pieces, and other fittings, executed in a fine though unpretentious style with a masterly hand. Every cut of the chisel or gouge tells, and these enrichments were executed by craftsmen without hesitation, and can be carried out with considerable rapidity of execution.

But it is not my purpose to deal with wood-carving historically, so I will pass to the practical part of the subject at once.

The wood for carving should be the best of its kind, free from knots, shakes, or other defects, as the specification always mentions, well and naturally seasoned, that which is baked, steamed, or seasoned by any artificial means being harsher and more brittle under the tool; or as the carver says "without any nature in it."

Unless the work is small in detail the wood should not be too hard to produce the best results.

Take oak for example, if the wood has hard fibres running through it, like most of the American species, it is much more difficult to work, and prevents the carver using his tools with freedom. Figured woods, again, most of which figure is produced by the change in direction of the fibres, are difficult to finish.

The carver has to continually change the direction of his tool, which prevents those happy effects and twists on the face of a piece of foliage or ornament, which seem to suggest themselves naturally, if the course of the tool were not impeded by the different directions of the grain.

(Some specimens of wood on the table will explain this better than words.)

To obtain clean cut work the carver must cut with the grain, much as a boy who whittles a stick with a knife or a joiner planes a board with his plane. The piece of Padouk has been fixed with a metal plane, a cut has afterwards been made upon the face with a flat gouge; you will see that one-half of the cut is clean whilst the other is against the grain.

The piece of mahogany has also the same defect, which increases the difficulty of cutting the work clean.

A piece of carving cut against the grain is seldom satisfactory; it can be done, but to dig a piece of ornament out of the end of the grain is a very vexatious proceeding, and withal expensive.

Take a simple illustration: An impost cap, carved with egg and tongue, if worked by the joiner in the solid, the returns are end grain and the ornament must be cut against the grain or fibre of the wood.

If I have not made this clear one of the carvers will illustrate it practically.

A piece of good Kiga wainscot is the best wood for architectural carving (but it is now very scarce, and the Hungarian oak is the best substitute); the grain is not too strong, and one can deal with it to free freedom than any other wood.

Mahogany is very variable. Some kinds are very good, others very indifferent. The Mexican and African, for instance, cutting very much like cork, that is, it will not stand against the tool. The harder kinds of Cuba and Spanish mahogany are rather more expensive working, especially if figured.

Teak is a good wood for carving; it wastes freely, or perhaps we should say, the surplus wood is easily removed, and the work shaped readily. Another advantage possessed by teak is that when used for purposes where the material is cut away more in some parts than others, as, for instance, an animal terminal or very bold panel out of 6 in. or 4 in. plank, it is more likely to stand than some of the other varieties of wood. Its only fault is that the grit in it dulls the edges of the tools rather quickly.

Walnut is a fairly good wood for carving, the American being the easiest to cut. The English is very close and firm in the grain, and some of it is very hard. The American walnut is rather remarkable for showing a whiteness on the surface of the wood after it is finished if viewed in certain lights. On turning the wood round the whiteness is reversed; this, of course disappears if the wood is polished.

Italian walnut carves very well if straight in the grain.

Satinwood carves well, and, being light in colour, the work is effective.

Pine is less expensive to carve, but it is easily damaged if used for undercut work.

Lime tree is a splendid wood for carving, but so perishable that one can only recommend it for temporary use, such as patterns for metal casting, for which it is admirably adapted, although some founders prefer mahogany for that purpose.

Kauri pine cuts well, but has the reputation of shrinking lengthwise in addition to across the grain, a fatal defect for joiners' work that cannot be provided against.

It is quite enough to have to contend with the ordinary shrinkage in wood without the shoulders of framing showing an open joint when the work is finished.

Some samples of bass or American whitewood cut well, some very badly.

English cedar and pear tree are also good woods for carving.

Pitch pine is unsatisfactory, the darker portions of the fibres are hard to work, it develops shakes when the wood is cut into, and if very dry it is harsh and short under the tool. In fact pitch pine and yellow deal are nearly at the bottom of my preference of woods suitable for carving.

Sequoia (the dead wood from the mammoth trees of California) is simply bad, and it is well nigh impossible to get any life into the work. It cannot be cut clean across the grain and dulls the tool almost immediately. Cork is almost preferable.

Most of the Australian woods, Yarra and others, Padouk wood from Burmah, are all very indifferent for the use of the wood-carver.

The tools next claim our attention. They require to be of the very best steel and well tempered. The shapes seem to have varied very little through the centuries; some found in the Pyramids, and now in the British Museum, are similar in shape, but made of copper or bronze, to the tools of the present day.

A wood carver requires a set of flat gouges from  $\frac{1}{4}$  in. wide to  $1\frac{1}{2}$  in.; a set of quicker section gouges, called "fluters," though used for many other purposes than fluting; some flat tools of varied widths called "firmers"; small quick-section gouges known as "veiners," though the less they are used for putting veins on the faces of leaves the better for the appearance of the work.

V shaped tools, called "paring tools," are also necessary. Besides all these, a certain number of similar tools, but bent instead of being straight, are required. These are necessary to take up the cutting in the hollows or undercuts where the straight tool would stick into the grain of the wood. There is also a variety of tool known as the "macaroni," which is of doubtful utility for ordinary work. A set of oil-stones ground to fit the various sections of the gouges, and called slips, is indispensable; a leather strap prepared with tripoli, similar to a razor strop, for putting a fine edge on the tools after sharpening with the slips, is also necessary. Small wheels are used to clean out the inside or concave surface of the bent tools. A mallet of wood, lead, or iron, bench screws, clamps for holding the work, and a pair of compasses, make a fairly complete list.

All wood carvers' tools require to be carefully sharpened, and kept in good order, if the work is to be cleanly and well finished. We may note that the tools are generally sharpened by rubbing both sides, and not as joiners' tools with the cutting edge at one side; for soft woods the tools must be sharpened at a more acute angle than for the harder varieties. To distinguish the tools from one another as they lie upon the bench, the carver uses wood of various colours and shapes for the handles of them. Those not in use are generally kept in a small chest containing a quantity of small drawers or trays. On the table are specimens of carvers and joiners' tools, showing the different methods of sharpening. The bench must be kept free from grit if we wish to preserve a good edge upon the tools.

The simplest and most inexpensive kind of wood carving is that in which the outlines of design are first set in from the face of the wood, and a gouge or other tool then being used to make a sloping cut to meet it, thereby taking out a chip or piece without leaving any rough places or awkward corners to be cleared out afterwards. This description of ornament is used very frequently on Jacobean furniture and old chests; some spandrels of the Gothic periods are also examples of this kind of treatment. The faces of acanthus leaves in the enriched moldings and some of the capitals of the seventeenth and early part of the eighteenth centuries are also worked in a similar fashion. This treatment obviates grounding out the ornament, which must be done in ordinary work, such as a spandrel or panel showing a background.

We will now describe the method of carving an ordinary panel or spandrel. The joiner has rebated the wood all round to the depth of the groundwork for the carving; if it is a large panel he has glued it up, in this case taking care to put the tongue in joint far enough back to prevent us cutting into it; a precaution which I am sorry to say is not always observed, to the obvious detriment of the work, especially if the cross tongue is of deal in a hardwood panel.

We sketch or paste a tracing of the design to be carried out on the wood, and proceed to cut away the parts that are to be the ground of the panel, afterwards using a tool known as the "Old Women's Tooth" to rout out the wood to the required depth. Care must be taken during this



part of the work that no cuts made by the chisels or gouges in forming the outline should go below the surface of the ground. In hurried work this is a very common occurrence and frequently shows much if the work is afterwards polished. This seems a very mechanical proceeding, but it is the general method; one reason is that when the face of a piece of wood is roughly cut away it is difficult to sketch upon, therefore the carver likes his outline set in first, that he may be able to keep to his design. When the panel is grounded, the finest skill of the craftsman is called into play to balance the masses in the design, decide the parts that are to be in high relief, in contrast with those near the ground, and generally to arrange the projections so as to produce the best effect. In fact this part of the work tests the ability of the workman to the utmost degree, and shows whether he is a skilled craftsman, or merely one of those who, unfortunately, never seem to be able to master their craft, and always require a model or copy, which they reproduce with more or less success.

After the panel is roughed in, if possible, it is advisable to put it on one side for a short time; it is good for the material, for, after cutting away one side of a piece of wood, it is well for it to be laid by. It is also frequently good for the design; when taken up again to finish the work faults are less likely to be overlooked than if the carving is finished off without interval.

The outlines are generally cleaned up first, then the ground finished to them, the face of the work being the last part to receive our attention. Here, again, the craftsman has an opportunity to show his ability, or otherwise.

The groundwork of panels is sometimes stamped to give a matted effect and bring out the ornament, but it is not a desirable treatment, giving a common appearance to even good work. The best finish for the ground is that of a slightly undulating, but smooth, surface.

We will next take a length of moulding, egg and tongue or leaf enrichment, for example. First space out the ornament, then mark the outline upon it, and set it in as we did with the panel. The groundwork is next picked out and the face afterwards carved, the more projecting parts being finished last. If egg and tongue, the shell is set in, the egg shaped and finished, the tongue being carved afterwards. We may remark here that full-sized sketches of egg and tongue or other mouldings as given us are often very deceptive. The enrichment is generally drawn on the moulding in elevation, probably looking fairly broad or otherwise in correct proportion, but, when developed on the actual moulding, it becomes quite different, and really works out very much narrower than was expected. If these sketches are set out for short breaks, it is evident we must either alter the arrangement or execute the work to a different proportion than that shown or intended.

Gothic strings and space ornaments are sometimes cut in the solid and sometimes applied in both old and modern work. If applied with an intervening space between the carved portion and the cavetto background, there is a lightness of effect and more shadow than can be obtained if they are worked out of the solid stuff.

The section for a carved moulding is an important point; if it contain deeply sunk hollows, the carving must be done with bent tools, which increases the time required for its execution. The model for an architrave similar in section to those at Hampton Court Palace, but with simpler detail, is a good example of its kind; but flatter sections are much more economical to work.

Capitals generally should be prepared with the grain of the wood vertical for carving. If the grain is horizontal, as for Ionic caps with angle volutes, they must be glued up at the mitres or angles, otherwise two sides have to be carved endwise in the grain. If the caps are of any size they should be built up.

Take a Corinthian cap for instance: a good method is to glue up the bell in sections with angle and centre scrolls in the same pieces of wood; if for a column, have the bell turned. The scrolls and husks can then be carved, and well undercut, or pierced if preferable; the lower tiers of leaves being absent, there is more room to get at the undercut parts. The leaves for lower part of cap are shaped and carved separately, being afterwards glued on and screwed from the back or inside. It is also convenient to build up the abacus in pieces, and if properly put together with dowels and well screwed to the cap, the whole will stand better than if cut from a solid piece of wood, even if such could be procured large enough for the purpose. The Corinthian

caps on the choir screen at St. Paul's Cathedral are built up in a similar fashion to that just described. If the caps are executed in the solid, the probability is that roughing-out and exposing fresh parts of the wood to the action of the air will cause the outer parts of cap to shrink rapidly, so that splits or shakes develop themselves, which, after a time, may or may not, close up again. It sometimes happens if the shakes are filled up they will split up the cap, acting as wedges when the inside parts of the wood shrink.

The endless or hand-saw and fret-cutting machine are valuable aids to a wood-carver when the outline can be cut or pierced before the work is shaped or roughed-out—cresting or tracery for instance. The small terminals on the table will demonstrate this. One is as it comes from the saw, the next with the superfluous pieces knocked away, and the third roughed-out.

This method is sometimes adopted for work with a background, especially if in high relief; the outline of design is cut with the saw, being afterwards glued upon a background and well screwed from the back, or, if for painted work, fastened with fine nails or brads from the face as well. The carving is sometimes done before and sometimes after being placed on the background. By this means the operation of grounding is saved, but the perfectly level background is not so artistic-looking as the slightly undulating one produced by the first method described. It is almost needless to say that the design must be thoroughly thought out before the fret-cutting is begun.

The large console on our left was cut to the outline before being carved; the surplus wood is thus easily removed; it is then roughed out, and afterwards finished as described in the case of a panel. The enriched three-quarter column was first made out with deal to complete the circle, then turned and carved.

The mouldings forming the cornice and those round panel in satin wood were prepared with the aid of machinery, then mitred-up and fitted by a joiner, the joinery carefully marked and protected; the pieces are then carved before the mouldings are glued up, the mitres being finished off afterwards. The wood-carver always prefers his work in small pieces; as a rule, he lays and fixes it on the bench before him, whereas the stone-carver, if possible, puts his work up in front of him. It is rather remarkable that in those cases where the craftsman is both a stone and wood-carver he puts the stone up in front and lays the wood down before him.

The explanation is that the stone-carver does most of his work, even when finishing, with a mallet or hammer, whereas the wood-carver, hampered by the grain of the wood, has more power over and a freer use of his tools by having the work below him.

Wood-carving executed *in situ* is always much more expensive than if done on the bench, before the work is put together.

Cutting tracery is part of the wood-carver's craft, though it is often left to the mercies of a joiner, who gets as much as possible done by a machine, which takes all the spirit out of the cusps, the pockets and mitres being sometimes wonderfully, and sometimes fearfully, worked afterwards.

Simple quatrefoils on the table show the difference in the appearance of plain cusping when worked by hand and by machine. Those worked by hand stand up and have a crisper effect than the one taken off to a dead level by the machine.

The slightly-varied section of the moulding as worked by hand is also better looking than the mechanical hollow which runs with unflinching regularity through the machine work.

While speaking of tracery we may mention that amongst the small models will be found some examples of carved cusps and terminations.

An interesting branch of wood-carving is the preparation of models for metal work. These, if very small, such as bows for keys, are made of boxwood, the larger patterns of lime tree, pear tree, or mahogany. This work requires considerable skill and judgment, in order that the pattern may lift from the mould without damaging it. All undercuts must be avoided, and the effect obtained without them in ordinary work, for obvious commercial reasons. It is often necessary to make the pattern in several pieces in order to draw it out of the mould.

They are sometimes cored or worked out at the back to the thickness of metal required, and sometimes solid, at the discretion of the founder. There are some examples of patterns before us; that for the hob of a grate was made for a fire-

place exhibited at the late Arts and Crafts Exhibition. The terminals were for the gunmetal gates at the New Gallery. There are also some patterns for a tomb railing and parts of a monument prepared for execution in bronze.

Into the province of designs for wood-carving it is not my intention to enter, but it is desirable that they should be worked out on paper, or a model made, that the craftsman may cut into the wood without hesitation, or, as we say, "without having to feel his way." He should be able to mentally see or imagine the effect of his work when finished, before or whilst roughing out the subject.

Figures always require modelling before being carved, unless they are to be in very low relief, in which case a skilled carver can produce good effects with the aid of a careful drawing.

The spandrels, of which a set of photographs are exhibited, were executed in this way. The plaster models for figures, animals, and ornament exhibited have all been prepared for wood-carving. The angels with instruments, labels, &c., on the screen were executed in mahogany for the reeredos shown in the photograph below them. On the table are models for stall terminals, heads for seat elbows, some animals for staircase newels, also carved drums for columns, and other architectural features, some in wood and some in plaster.

Specimens of old work are also on the table. In the fifteenth-century panels from Sedburgh Church the treatment of the face of sacred monogram should be noticed. Two carved stair-ends, date 1790, are similar in design, but show just sufficient variation in treatment to mark them as handicraft, and not machine or cast work. Some casts of small spandrels from an old screen at Hayes Church, Middlesex, should have been here; there is a photograph of an inlaid carved table, the date 1605 being worked in inlay on the frieze. We might mention that this church, so near London, is well worth a visit, the fifteenth-century roofs remaining in nave and aisles; there are also some good brasses, a fresco painting, the old timber porch, and other interesting features still to be seen.

Concerning polishing, as a rule some polish is required to protect wood against changes of temperature, and to keep it clean or bring out the colour. If left from the tool or plane, some woods soon show the dirt very much, especially in this city of ours; and, therefore, some protection is necessary. But let there be as little polish used as possible. It is generally applied with a brush, and needs great care, for at the very best it spoils the appearance of the carving, for a time at least; and certainly in no case does it improve the work. It is generally disappointing when the carver sees his work for the first time after being polished. Teak is a satisfactory wood from this point of view, it being a good colour, and standing well without polish. A good treatment for oak is to have it fumed in a chamber with ammonia, afterwards finishing with wax polish.

Just a word respecting apprenticeship. Unfortunately, it seems to be going out of fashion in this as in other trades and crafts. Personally, I do not think anything can take its place entirely. The technical schools are invaluable as aids to the young wood-carver, but cannot altogether substitute the training to be received in a shop; the experience gained upon actual work is not to be obtained in any other way. The present system is that lads try to become attached to a shop as improvers, with a tacit understanding that, if they are industrious, and behave themselves generally, they will be retained on the general staff of workmen. There is a certain advantage in this plan, that the lad knows that he is liable to dismissal if he does not behave himself, and, further, that the more interest he takes, and the better craftsman he becomes, the more it is to his employer's advantage to keep him.

In conclusion, we would urge that architects should always retain some control over both the quality and prices for wood-carving. In many cases this is done, to the obvious advantage of the work, but in others it appears in the quantities included, perhaps in so many feet super of framing or doors, all to be executed as detail at end of bill, which said detail gives a very indefinite amount of information, thereby making the carving quite a negligible quantity until the full-sized drawings appear, when the architect's requirements, the builder's provision for costs, and the carver's views of the matter are far as the poles asunder.

In many cases it is impossible to do justice to the work, and the result is painful to all beholders.

Wood carving, to be done well, must be paid



or, therefore, it seems to me that some control should be kept over the price as well as the quality of the work.

I must now thank you for the kind attention given to my paper, hoping that the remarks may help to excite some interest in the subject, and that it may be understood that there are some earnest workers in the craft; though their productions are often sadly handicapped by the limit of prices, quality of material, the multiplicity of styles that are used, and wherein the conditions of work in the present day differ so much from those of the old craftsmen, in whose time a style came into existence and developed and died out in a kind of natural evolution, whereas now it is one period to-day and another to-morrow. But if the craftsman brings some study to bear upon his work and strives to produce the best that is in him, surely his productions should have something of true craftsmanship about them.

At the conclusion of the lecture, the President said that before the discussion on the paper commenced he desired to say a few words as to Mr. Fleming's resolution. His (the President's) legal adviser had informed him that it was unnecessary to bring the resolution before the general body of the meeting, because the Committee had already decided to grant the inquiry Mr. Fleming asked for, but Mr. Fleming felt himself that it would be more in order if it were put to the meeting.

Mr. A. W. Earle then formally seconded the resolution, which, on being put to the meeting, was carried unanimously.

Mr. Beresford Pite, in proposing a vote of thanks to Mr. Daymond for his paper, said that he remembered the time when Mr. Sedding said that he would never be happy till he could get a mess on to the floor of the Institute, and to some extent they were indebted to that sentiment in seeing a bench with chips and shavings, and all the rest of it, in that highly dignified apartment. There were one or two things which had always been difficulties in his mind with regard to the wood-carver's craft. The first was that he did not see how good wood-carving could be produced from putty or clay models. He had a sort of idea that Burgess had a consciousness of that great difficulty, because he used soap as a modelling material for carving, and cut with great ease. If one set to work in a hard material from a model made in soft material, the probability was that an unsatisfactory result would be effected. He knew the way out of the difficulty, but whether it could be done in their lifetime was another matter, that was to train carvers without models. He would venture to throw out the suggestion that it was curious that the finest wood-carving in the world was that of the greatest antiquity. Professor Poole, of the British Museum, had said to him that the most life-like wood-carving, with the greatest spirit in it, was that of the Egyptian images of priests in the museum of Boulak. He had recently seen these in the new museum at Ghizeh, and found that the carving had a life-like effect, surpassing anything we had in the work of other ages. These figures of an antiquity of 3,000 or 4,000 years were really masterpieces of the art of wood-carving. Practically they were very much indebted to Mr. Daymond for a hint or two as to making drawings for carvings and as to building up Corinthian capitals. He should venture to try and draw from Mr. Daymond some criticism of Grinling Gibbons' work from a wood-carver's point of view. He spoke in warm terms of it, but would he tell them the fine quality of it?

Mr. Bolton, in seconding the vote of thanks, said that in the design of wood-carving it was as well to keep in mind the nature of the material. The two main qualities of wood were beauty of surface and a fibrous nature, both of which will be found fully displayed in old work. Thus, in late Gothic stallwork, the canopies are carried out with a marvellous elaboration of detail, the wood being, as it were, cut to ribbons, which was only possible in so fibrous a material. In the carved work of the Italian Renaissance, marble sculpture, essentially a surface treatment, had a strong influence, but in panels of the characteristic arabesque designs, both treatments were combined. Anyone who was disposed to rival Early Renaissance stallwork, or other elaborate carving of that period, would probably find great difficulty in finding carvers to-day capable of well-executing figures as small as were to be found in many instances. He remembered an example of Serugete's work, where some small columns had

little bas-relief figures round the drums, executed with great perfection of outline and modelling.

A member said he should like to ask Mr. Daymond to give his view as to darkening oak by ammonia or any other process of that kind.

The President said that Mr. Daymond referred once or twice to the polishing of wood carving. It seemed to him (the President) that if carved work were polished, it was absolutely fatal to it. He thought that was one of the curses of modern furniture. He wished to ask Mr. Daymond why he recommended any kind of polishing for wood carving? Coming back to the great Gibbons, he often thought that if he (Gibbons) had done all the carving he was said to have done he must have lived for a good many hundreds of years. Wherever one went in England and saw any carving in his particular style of art it was always put down to Gibbons. Of Gibbons himself, as a carver, of course one could not but speak very highly, but in his (the President's) opinion his designs were often unsuited to wood. Mr. Daymond had mentioned several kinds of woods that he (the President) had never heard of, but there was one wood which he should like to hear about. It was called padook.

It looked like mahogany, but he (the President) supposed it was not. Then the practical difficulty that Mr. Daymond referred to as to prices. That was a great difficulty to architects he thought. Probably most of them had had the same experience as he (the President) had had. Men came to see them, bringing photographs of work they had done, and asking a chance of bidding for their work, as they could do it so much cheaper than anyone else. It seemed to him a perfectly horrible idea to have carving the subject of competitive prices. Competing in prices seemed to be destructive to art. Apart from this there was the difficulty as to how architects were to get an idea as to the cost of enrichment. He did not mean figure carving, but the mouldings of architraves and door panels and so on. It was difficult to know how you were to arrange for mouldings and carving when they were mixed up together. Joiners would express their feelings very strongly about making mouldings when a portion of the mouldings had to be carved. He did not know whether Mr. Daymond could advise them how to know where the joiners' work left off and the carvers' began.

The vote of thanks to Mr. Daymond was then put and carried by acclamation.

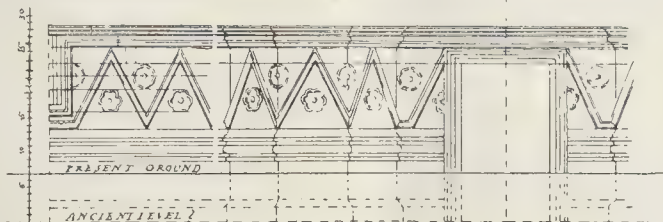


Fig 1

Mr. Daymond, in reply, said, with reference to what Mr. Pite said, he thought that it must really be considered necessary that the wood-carver should have a model. It was very rarely indeed that a figure was done without a model of some kind. Michelangelo might have done it without a model, but they saw his models about in various museums. Supposing the wood-carver started to carve a figure without a model, he might do it to his own satisfaction, but how could he tell what was in the architect's mind? Referring to what Mr. Bolton said as to the carver being frightened at the little figures, he (Mr. Daymond) was thinking whether those little figures came in at the back of the bill. Some of those things cropped up at the last moment, and then there was a difficulty. As to darkening oak with ammonia, he personally thought that it was a very good treatment, but they must put a little colour in it, otherwise it was not permanent. He did not believe in polish, but he could not see how they were to avoid it. If a piece of carving were left unpolished, the plain part being polished, it would look very queer. That seemed to necessitate polishing the wood. Of course, in many cases, panels could not be left without polish, and they were sometimes, but in no case could they give carving the same polish as polished wood. As to the difficulty of knowing where the joiner's work left off and the carver's began, he thought that that question could be

answered by saying that the joiner generally left off where the machine stopped. As a rule he thought that joiners generally stopped where the work had to be done with tools. If they examined joiners' tools and wood-carvers' tools, he thought the difference between them would show who ought to do the work.

The meeting then terminated.

ARCHITECTURAL ASSOCIATION DISCUSSION SECTION.—The fifth meeting of the Session was held at No. 56, Great Marlborough-street on the 24th inst., the Chairman, Mr. C. H. Brodie, presiding. Mr. T. J. Wetherall read a paper on "Terra-Cotta," considered both historically and practically. The discussion which followed was opened by Mr. F. G. W. Buss, and at the conclusion was summed up by Mr. T. E. Collcutt, who attended as Special Visitor, and contributed many useful hints and suggestions from his own experience. Mr. J. Miller Carr, who also was present by special invitation, gave the members the benefit of his practical knowledge of the material and its capabilities.

#### THE PALACE AT MASHITA IN MOAB.

THIS building, discovered by Canon Tristram, is one of the most interesting of architectural puzzles. When photographs of it were brought to England, Fergusson at once saw its remarkable character, and proposed a theory to account for it, with a restoration of the façade as a lofty palace. He pronounced it to be a "Persian" palace, built by Byzantine artists for Chosroes II. between the years 614-627. This was accepted by Professor Rawlinson in his "Seventh Oriental Monarchy."

The best series of illustrations are those given in "The Land of Moab" (H. B. Tristram, 1873). Some of these are repeated in Fergusson's History (Vol. I., 1893).

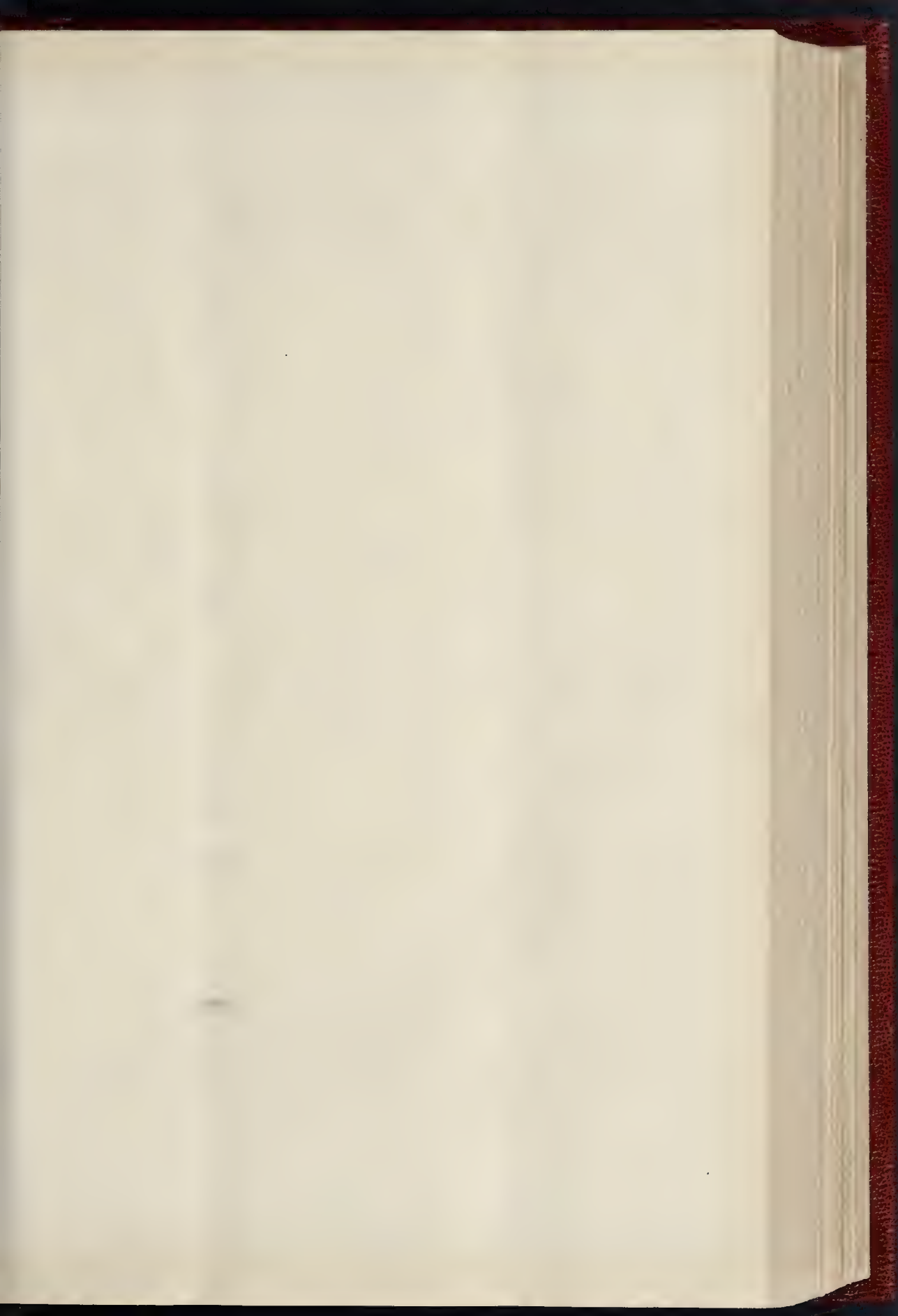
Some study last spring at Constantinople of Byzantine types of work, both earlier and later than Sta. Sophia, has convinced me that the building is at least a century older than the date proposed by Fergusson, and that he was mistaken in supposing the series of triangular gables—containing rosettes and entirely covered with delicate sculpture of foliage, amidst which beasts drink at fountains and birds peck at the fruits—a plinth. (a) Ruins usually have to be excavated, and the woodcuts seem to show, as might be expected, a

considerable accretion of soil. (b) The illustration which is the basis of the sketch elevation, fig. 1 shows the series of mouldings, now just above ground, projecting as a frieze or subbase, not as a plinth (Tristram, 371). Fergusson in his restoration fills the ground up to underside of subbase, instead of clearing it away. It must be allowed, however, that the smaller cuts of door and tower do not show the recession beneath the mouldings, and this may occur only in the curtain walls. The essential point is the lowering of the ground. (c) The cut given on page 109 shows the width of the door and the probable height at which the lintel was fixed, which was such as would have allowed the cornice, which touched the tops of the triangles, to pass directly over it as usual in Byzantine door cornices. Now, this door, of which the relative width and height are given as accurately as possible in fig. 1, would be of abnormal proportions, and requires at least a height which would lower the original level to the dotted line.

This at once gives the triangles a more familiar appearance, and we can see that they are a series of decorative gables developed from the steep pediments over decorative niches that fill the space of wall by the entrance doorways in so many Late Classic buildings in Syria. If we turn to the illustrations given by De Vogüé of the sixth-century church at Baqouza in central Syria we find a piece of design entirely parallel; first





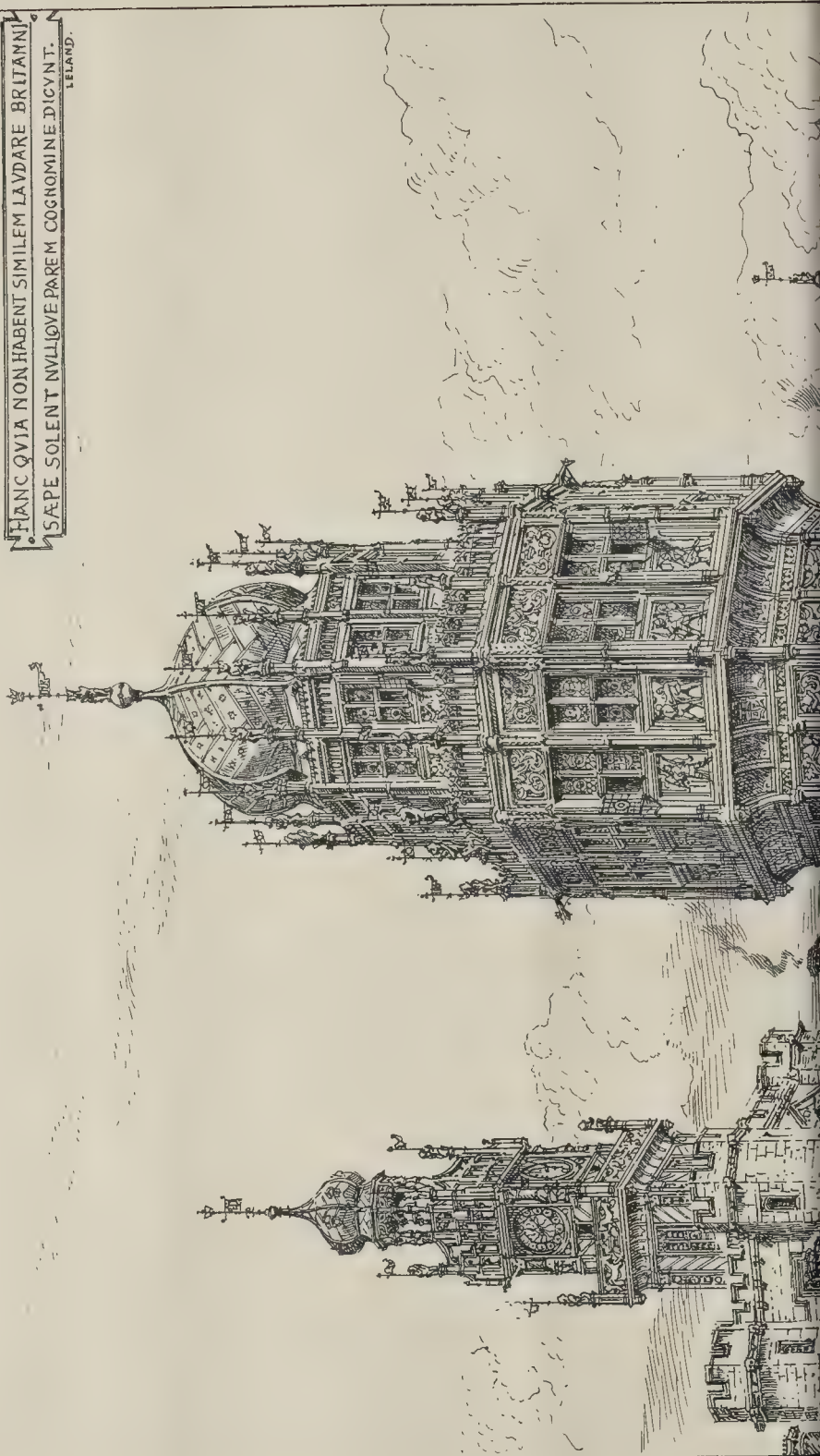




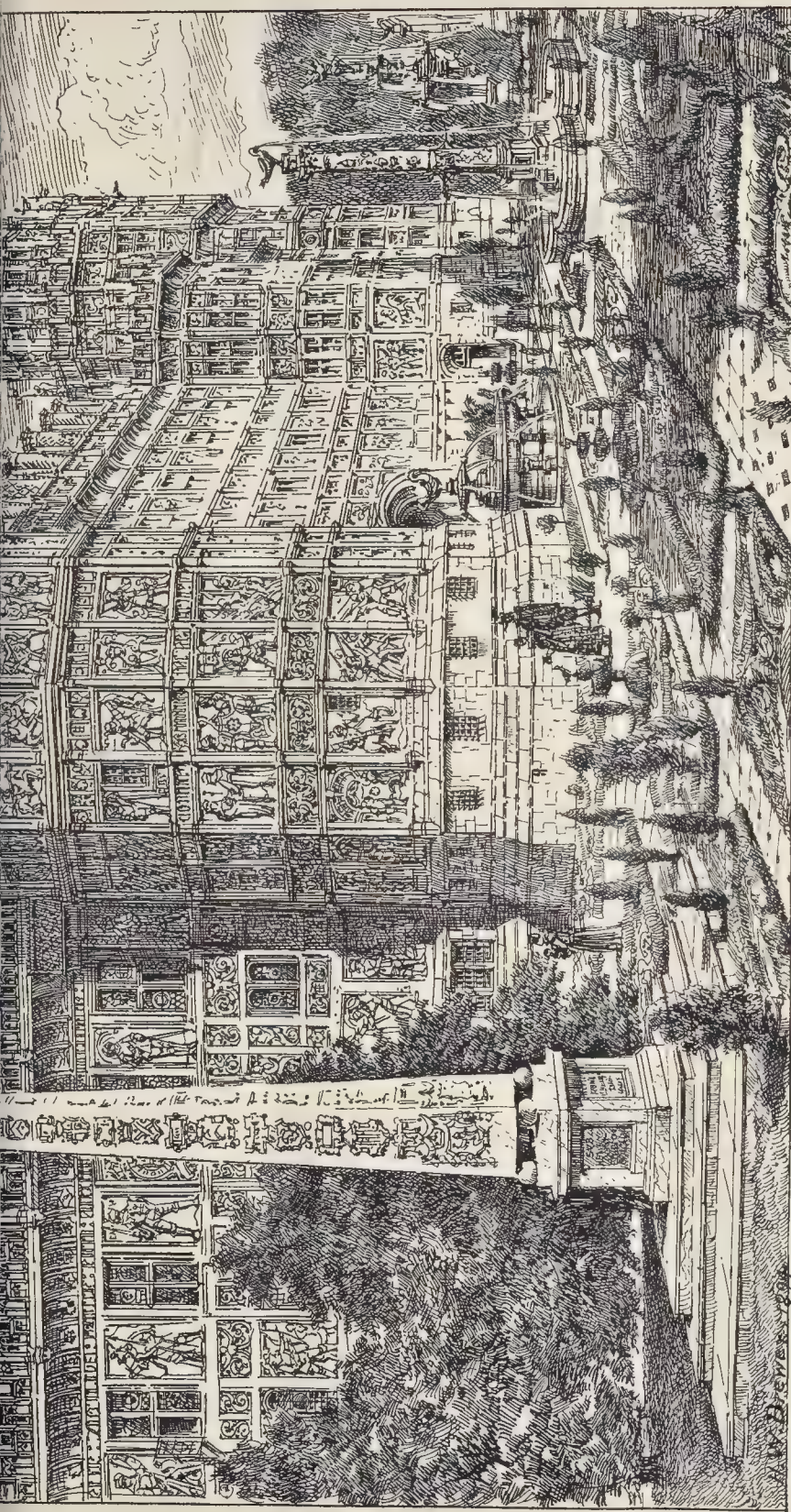
THE BUILDER, JANUARY 27, 1894.

FIANC QVIA NON HABENT SIMILEM LAVDARE BRITANNI  
SAPE SOLENT NVLLIQVE PAREM COGNOMINE DICUNT.

LELAND.







THE CLOCK-TOWER: THE EWES: THE GREAT PINACLE:

THE WATER-TOWER.

THE WASH-BOULE.

THE PAWLON-PERCHES, MAR-POUMMIN.

NONSUCH PALACE A RESTORATION BY MR H W BREWER

PHOTO-LITHO SPRACUE & CO 435 EAST HADSON STREET NEW YORK N.Y.





one against. Mr. Hunt then moved, "That the envelopes marked 'K' and 'I' which accompanied the designs for the Pump-room Extension, to which the Council has awarded the first and third premiums, be at once opened, and that these designs, together with the design marked 'O,' be exhibited to the public for a fortnight, and that the plans of the other competitors be returned to them forthwith." Mr. Taylor seconded. Mr. Knight then moved, "That all the Plans should be on view for a fortnight." This was agreed to, and Mr. Hunt's resolution, as amended, was also agreed to, and the envelopes were then opened, when it was found that the following were the successful competitors. K.—(First, premium of £100)—Mr. J. M. Brydon, London. (Third, premium of £50)—Messrs. Baggally & Bristowe, Conduit-street, London.

#### ARCHITECTURAL SOCIETIES.

**LEEDS AND YORKSHIRE ARCHITECTURAL SOCIETY.**—Under the auspices of the Leeds and Yorkshire Architectural Society, Mr. J. Lane, of York, delivered a lecture on the subject of "English Cathedrals," on the 22nd inst. Mr. G. B. Bulmer, President, occupied the chair. The lecturer observed that amongst the evidences during the present century which point to the rapid development of art, nothing was more exemplified than the revival of Gothic architecture described in the multitude of new churches and restorations of fabric of the older cathedrals in every part of the British Isles. With domestic architecture, however, there was a strange contrast, for, with the exception of here and there a stately castle, time and the exigencies of civil war had removed the contemporary specimens. But the cathedrals of England had defied the ravages of time, wars, revolutions, and so-called restorations; and these mementoes of the nation's early piety still called nineteenth-century architects to witness that abbot, prior, and monk of the pre-Reformation days could design and erect edifices of surpassing grandeur and beauty, to furnish models and specimens to modern designers. Who could deny that there was much originality to be admired in the unique octagon of Ely, the spire of Salisbury, the nave of Winchester, the west window of York, the five aisles of Chichester, the west front of Wells, Peterborough's painted ceiling, Lincoln's angel choir, and Exeter's minstrel gallery? Many of our cathedrals lost much of the variety to be produced by the grouping of their fine outlines, owing to the fact that they were situated in the midst of large towns on the low level of a surrounding plain, such as that of York. But in places where the edifice towered high above the neighbouring dwellings the country reaped the benefit of a noble landmark. The Gothic style had this disadvantage, that its interiors lacked the colour decorations which added so much to the picturesque interiors of the Classic styles. It was not, however, an unmixed evil, inasmuch as the beauty of the carving was brought into prominence, and the vaulted roofs and clustered columns afforded outlines which were wanting in the St. Paul's style of interior. In the course of the lecture, views of the exteriors and interiors of all the English cathedrals were thrown on a screen by means of an oxy-hydrogen lantern. Mr. Francis W. Bedford has been appointed honorary secretary of the Society, to fill the place left vacant by the death of Mr. John Mettam, the former honorary secretary.

**NORTHERN ARCHITECTURAL ASSOCIATION.**—An ordinary meeting of the Northern Architectural Association was held on the 17th inst., in the Art Gallery Meeting Room, Newcastle. Mr. J. W. Morton, President of the Association, was in the chair, and Mr. Herbert Bacon (of the firm of Percy Bacon & Brothers, London), read a paper on "Stained Glass in Relation to Architecture." The paper was illustrated by numerous drawings, and by specimens of stained glass.

#### ENGINEERING SOCIETIES.

**LIVERPOOL ENGINEERING SOCIETY.**—The sixth ordinary meeting of this Society was held on the 17th inst., when a paper on "The Public Supply of Electrical Energy: its Cost and Price," was read by Mr. A. Bromley Holmes, M.Inst.C.E. The author recorded the progress made since the year 1890 by the Liverpool Electric Supply Company. Since the above date the length of street mains has been increased from twenty to thirty miles, and the number of lamps supplied from 12,000 to 25,000. The items which form the cost of production were

dealt with seriatim, and attention was drawn to directions in which, with an increased output, economies in working may be attained. The load on a station supplying electricity for lighting purposes was shown to be extremely variable, the maximum load in winter being one hundred times greater than the minimum load in summer, the cost of working the plant being much greater in consequence than would be the case were it possible to run the plant under uniform load. It was pointed out that great advantage would be derived from any practicable method of storage, but that the high cost of accumulators at present prevents their commercial use for that purpose. Various methods of charging for the supply of energy were described and compared.

#### ARCHÆOLOGICAL SOCIETIES.

**BRITISH ARCHÆOLOGICAL ASSOCIATION.**—The last meeting of this Association was held on the 17th inst., Mr. C. H. Compton in the chair. Miss Swan described the discovery of a remarkable stone object which has been found in digging the site for the new city buildings at Oxford. It is in the form of a small font, with four shafts at the corners and a central one. It is only 11 in. high, and of early Norman style. It is supposed to be a chrismatory. The Jew's quarter was formerly in the part of Oxford where the find has been made. Mr. Bodger sent for exhibition a series of Roman objects found at Peterborough, among which was a Roman colonial coin with a Greek inscription. Mr. Oliver described some beautiful lamps of Roman date, which have been discovered on the site of the tennis court of the old Marshalsea Prison, Southwark, which is now being covered with new buildings. Traces of piling indicated the position of an ancient water-course; and a boat-hook was found embedded in black mud. Many leaden spoons of sixteenth-century date were also met with. Mr. J. T. Irvine sent sketches of an interesting example of Norman ironwork at Leathley Church. A Roman horse-shoe of broad flat form, found at Colchester, was described by Mr. Wood. A paper on the parishes of Leeds and Bromfield, Kent, was read by the Rev. J. Cove-Browne, M.A. The various ancient buildings in the parishes—Battle Hall, the site of the Priory, and the mansion afterwards erected on part of it—were described. Another paper was then read on recent discoveries at Carnarvon, prepared by Mr. Sheraton. It was illustrated by photographs of the walls of the ancient Roman Station, and of the recently-opened timber roof of the church. Mr. Cann Hughes described various anti-British discoveries at Chester.

**GLASGOW ARCHÆOLOGICAL SOCIETY.**—On the 18th inst., in the hall of the Glasgow Philosophical Society, Dr. Alexander Murray, of the British Museum, lectured to the members of the Glasgow Archæological Society on the subject of "The Tomb of King Mausolus and its Attempted Restoration." Professor Ferguson, of Glasgow University, presided. The lecturer gave a minute description of the tomb, which, he said, had been characterised as the eighth wonder of the world. References to the tomb in ancient literature, he said, had tempted some of the greatest English architects to sketch a restoration of it. Even Sir Christopher Wren, despite his many other activities, found time to undertake such a work. The lecturer also spoke of similar efforts by several of Wren's successors.

**SCHOOL AND ART DEPARTMENT.**—The following permanent Inspectors have been appointed under this Art Department:—Mr. E. J. Ball, Ph.D., Instructor in Assaying, Royal College of Science, London; Mr. R. Blair, M.A. (Edin.), B.Sc. (Lond.), Head Master of the Public School of Science, Cheltenham; Mr. S. F. Dutton, M.A., D.Sc., Fellow of Trinity College, Cambridge; Mr. C. Gildard, M.A., formerly Scholar of Trinity College, Cambridge; Mr. H. H. Hoffer, D.Sc., Demonstrator in Physics, Royal College of Science, London; Professor D. E. Jones, B.Sc., Director of Technical Education under the Staffordshire County Council; Mr. D. S. McNair, B.Sc. (Lond.), Ph.D., Lecturer in Chemistry at the People's Palace, Mile End, London; Mr. C. McRae, M.A., late Scholar of Exeter College, Oxford; Mr. T. Preston, M.A., Professor of Physics to the Catholic University, Dublin; Mr. F. Pullinger, M.A., B.Sc., Organising Secretary of the Technical Instruction Committee of the Devonshire County Council; Captain T. B. Shaw, R.E., Occasional Inspector of the Science and Art Department; and Mr. H. Wager, Lecturer in Botany at the Yorkshire College, Leeds. It is proposed that these gentlemen should each take charge of a special district, and reside in one of the chief towns in their district.

#### Illustrations.

##### NONSUCH PALACE.

All the suburban palaces of our English sovereigns none has left behind it such a reputation for luxury and magnificence as Nonsuch. Leland says of it:—

"Hanc quia non habent similem laudare Britanni  
Sæpe solent nullique parem cognomine dicunt."

"Unrivalled in design, the Britons tell  
The wondrous praises of this nonpareil."

Not one stone of this splendid palace now exists, and its very site can only with difficulty be traced; but fortunately we have two fairly good old views of it. The first is an engraving by Hofnagle, dated 1582, and published in George Brown's "Urbium Precipuarum mundi Theatrum," and the other is a much smaller, but I think, more valuable engraving by Jodoc Hondius, dated 1610, in "Speede's Surrey." Both of these views represent a kind of elevation of the garden front of the house, with the outer court, in rather singular perspective, showing over it. Hofnagle's view only shows the upper part of the building, the lower portions and the interesting gardens, being concealed by a high garden wall; but in Hondius' view this wall is omitted, so as to show the whole building and the garden with its very curious fountains and other structures. Both of these views are more or less impossible and purely conventional in treatment; but with the help of the various descriptions remaining of the building, more especially the survey made by Cromwell's commissions in 1650, one is able to realise what this royal palace was like in its palmy days.

As Nonsuch was only commenced in the eighteenth year of the reign of Henry VIII. (1527), and was totally destroyed by order of the Commonwealth in 1650, it cannot, of course, have taken a very important position as a historical edifice.

Henry VIII. does not seem to have completed it, as it was purchased in an unfinished condition by the Earl of Arundel in Queen Mary's days. Henry, Earl of Arundel, is said to have spared no expense in completing the house and gardens. It seems to have passed again into the hands of the Crown in Elizabeth's time.

The Palace seems, somehow or another, to have passed into the hands of Lord Lumley, son-in-law to Lord Henry Arundel, but it was again sold to the Crown in 1591. The last royal person who inhabited it was Henrietta Maria, Queen of Charles I. In the survey taken by the Commissioners in 1650 it is described as "late percell of the possessions and joynture lands of Henrietta Maria, the relict, and late wife, of Charles Stuart, King of England."

Nonsuch Palace was situated near Cheam, in a village called Cuddington, which village, together with its church and manor house, would appear to have been destroyed to make way for the Palace with its park and gardens.

The buildings surrounded two courtyards. The outer, or lower court, measured internally 150 ft. by 132 ft., and the inner, or upper court, was 137 ft. by 116 ft. The "outer court" was upon a lower level than the "inner court," and there was a rise of eight steps from one to the other. Between the two stood a gate constructed of freestone three stories high, with embattled turrets at the angles, and crowned by a lead-covered tower to hold the clock, which clock and tower are said to have been "of most excellent workmanship, and a special ornament to Nonsuch." There was a little court to the east, which contained the kitchens and other offices. The larger, or outer court, was two stories high, embattled, and constructed entirely of freestone. It contained the lodgings of the almoner, chamberlain, and other attendants upon the queen, and also the buttery, wine-cellar, &c. And now comes a singular fact: although the lower, or outer court, which was only inhabited by court officials and servants, was constructed entirely of freestone, the portion of the edifice containing the royal and state apartments, the "upper court," was built of wood, except the basement: or perhaps, to speak more correctly, it was framed in wood, no doubt "post and pan" work. It would, however, appear that the wood was not visible outside, because we are informed that this part of the building was "battled" (embattled) with frames of wood covered with lead and supported with strong bars of iron "which battlements are a great grace and a special ornament to the building." The two great towers at the south-east and south-west angles of the building were also embattled with lead, and their laperns



were covered with the same material. The south-west tower (that shown in the foreground of our drawing) was the water tower. It contained a vast cistern of lead "of so singular a use that pipes being branched from thence supply the offices and the whole house with water." In fact, water was regularly laid on, as in a modern house. It would be interesting to know whether this was the first house in England with a regular water service.

The whole of the walls of the upper building except the basement were covered with a series of bas-reliefs in plaster representing figures and various scenes. It has been stated that these were composed of "rye dough."<sup>2</sup> Now, although rye dough may have entered into the composition, as it does into that of some modern kinds of stucco, yet, of course, it would not be sufficiently hard or white for the purpose alone. The German black bread does certainly get hard when stale, but if you soak it in water for a month or two it can be eaten in soup, but we never heard of its being used for building. There is, however, a passage in Leland quoted by Lysons, which seems to offer some solution of the difficulty. Leland says that at Cuddington, where the King (Henry VIII.) was building, "is a vaine of fine yerth, to make moldes for goldsmithies and casters of metals, that a load of it sold for a croune of golde. Like yerth to this is not found in all Englande." Now may not this "yerth," when mixed with the rye-dough, have formed a fine hard plaster, or stucco, in which these figures were either modelled or cast?

The gardens of Nonsuch Palace seem to have been as remarkable as the building itself. The principal garden appears to have surrounded the three external sides of the inner court; and probably from the fact that the private chambers of the King and Queen overlooked it, was called the "Privy Garden." The survey informs us that there was "a large garden called Privy Garden" lying round and adjoining into the three outsides of the inward court building—enclosed by a brick wall 14 ft. high, cut out and divided into alleys, quarters, and rounds, set about with thorn hedges. "In the said garden there is one piramede or spired pinnacle of stone," and near which, against the west turret, is placed one "large marble 'wash-boule,' over which stands a marble pellican, fed with a pipe of lead, to convey water into the same; there are also two other marble pinacles or piramedes called the 'Powlcon perches' (falcon perches) between which a fountain of white marble with a lead cistern, which fountain is set round with six trees called *lyla & tree*, which trees bear no fruite, but only a very pleasant flower." There are also "in the said privy garden one hundred and forty fruit trees, two ewe trees, and one juniper tree." &c. These fountains and the large stone pinnacle are all shown in the view by Jodoc Hondius. Probably the account given by Hetzner, who visited the place in Elizabeth's time, is not much exaggerated; he says that it was built "with an excess of magnificence and elegance even to ostentation; one would imagine everything that architecture can perform to have been employed in this one work; there are everywhere so many statues that seem to breathe, so many miracles of consummate art, so many casts that rival even the perfection of Roman antiquity, that it may well claim, and justify its name of Nonsuch, being without an equal, or, as the poet sings:—

This which no equal has in art or fame,  
Britons deservedly do Nonsuch name."

H. W. B.

#### GESO PANEL FOR CHIMNEY-PIECE.

The chimney-piece for which this panel was modelled is shown in the accompanying engraving, the whole being designed by Mr. Arthur Silver. The gesso panel illustrated in our lithograph plate was exhibited at the last Arts and Crafts Exhibition.

The chimney-piece is painted in broken white, flanked by wrought-iron brackets with pendants, and is decorated in gesso. Its chief importance as a design consists in the panel of the overmantel, which is a decorative symbolical suggestion of the Seven Days of Creation.

The panel is carved in gesso, and is stained green, and the design shows discs symbolic of the Seven Days, upon a winged spiral line suggestive of infinite progression.

The whole is treated in gesso overlaid with

<sup>2</sup> Lysons' *Engraving of London*, p. 111, note 32. Second Edition.



Chimney-piece with Panel in Gesso. Designed by Mr. A. Silver.  
(See Detail of Gesso Panel in Lithographed illustrations.)

white metal, and decorated with coloured lacquers, which culminate in brilliancy up to the climax of the work.

The gesso was manipulated by Mr. H. Napper.

The panel, which is a remarkable and very original conception, attracted a good deal of attention at the Arts and Crafts Exhibition.

#### "HURSTBOURNE," HANTS.

THE drawing, which was exhibited in the Royal Academy of last year, shows the entrance front of this mansion, of which Messrs. Beeston & Burnmaster are the architects.

We gave a view of the garden front, a plan of the house, and a description, in the *Builder* of November 11, 1893.

#### CHURCH AT DULWICH.

THE view shows the recent addition made to Emmanuel Church, Dulwich; of the two western bays of the nave and aisles, a baptistery, and two flanking porches. The arrangement of placing the inner doors at right-angles to the outer ones has the advantage of breaking the draught, while it makes the material as well as symbolical entrance to the church through the baptistery. This latter is separated from the nave by a screen forming a triple arcade enclosed by a wide arch. The columns are of blue Pennant stone.

As will be seen from the plan (see page 74), the

general outlines of the old building are retained, but the treatment of the extension in other respects is quite distinct from the old.

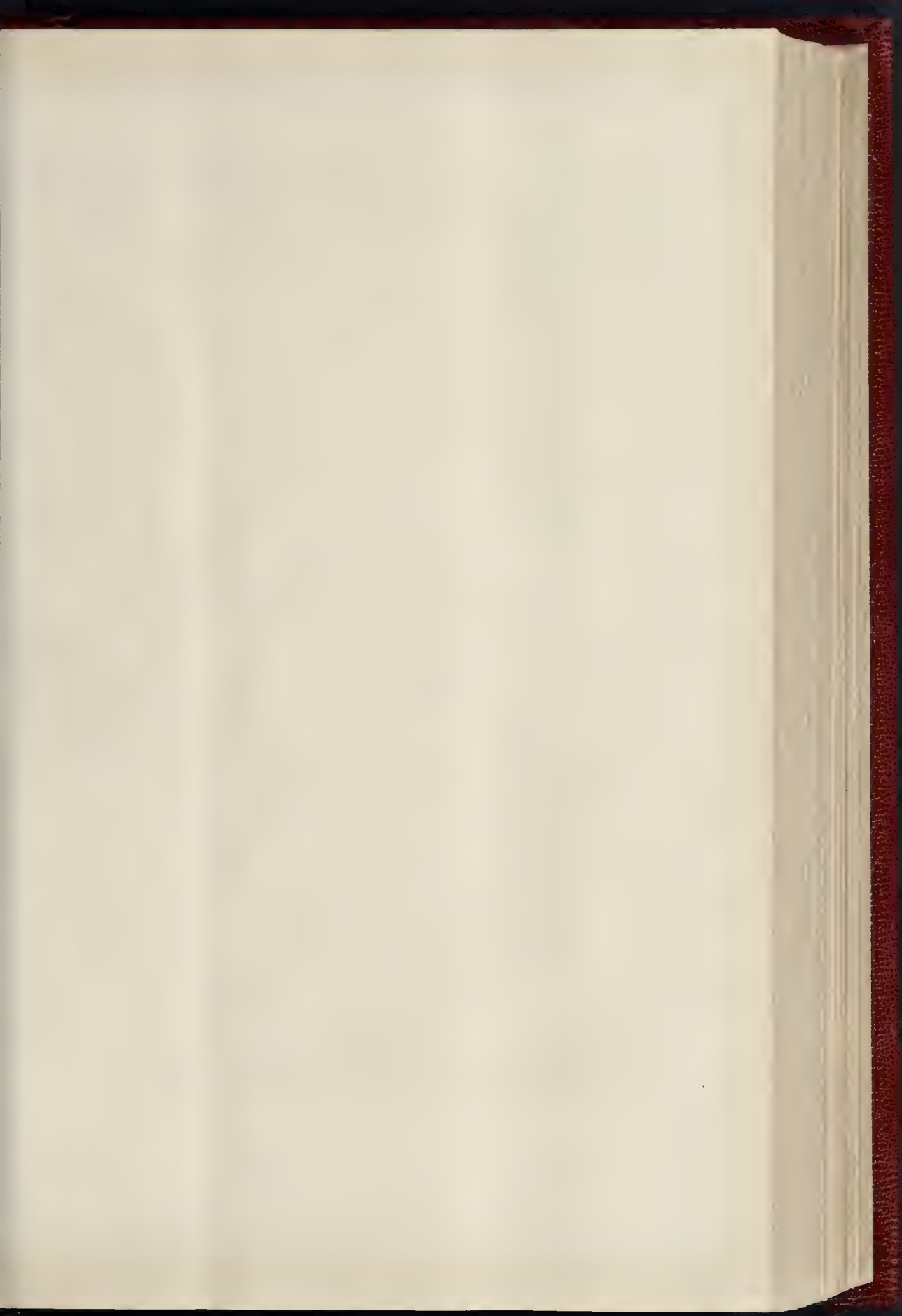
The west window has inside an arcade following the general outline of the window, and supported opposite the mullions by banded blue Pennant shafts.

The ceilings inside are boarded and panelled. The walls are of Kentish rag, with Box ground stone dressings, &c., externally, and for the nave pillars, while the facing internally is of white brick, with Corsham stone dressings, strings, arches, &c. The roof is covered with Broseley tiles on boarding and felt.

The contractor for the work was Mr. Marriage, of Croydon; the carving was by Mr. Bradford; the glazing by Messrs. Britton & Gibson. The work was designed by and executed under the superintendence of the architect, Mr. Edwin T. Hall. The drawing was exhibited at the last Royal Academy.

#### "COMPTON LEECH," HORNAL GARDENS, HAMSTEAD.

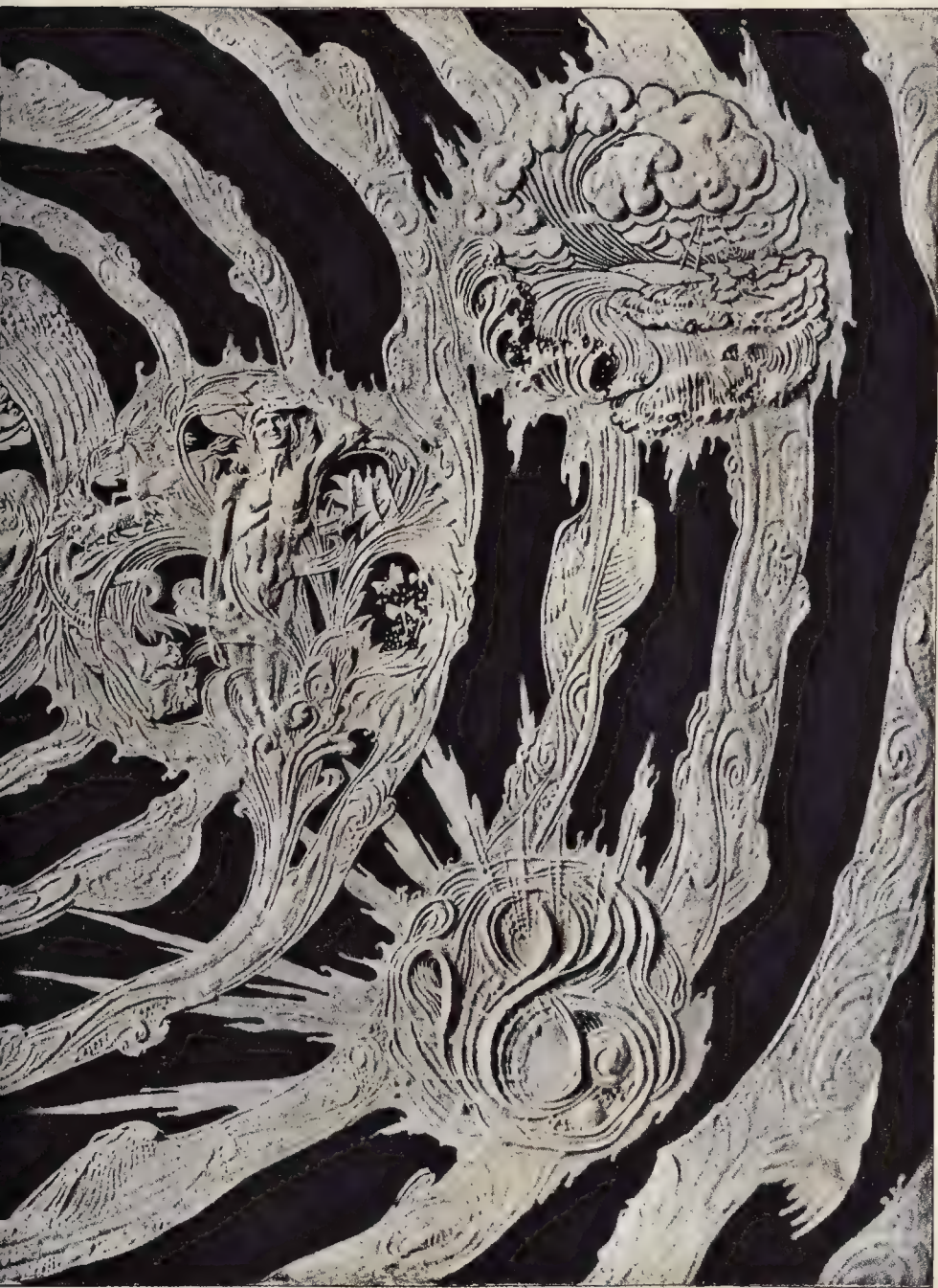
THIS house has been erected from the designs and under the personal superintendence of the architect, Mr. James Neale, of London. Messrs. Norris & Sons, of Sunningdale, were the contractors, and Mr. Morris was general foreman. The accompanying plans show the general arrangements of the house. The billiard-room on







GESO PANEL FOR AN OVERMANTEL, ST



THE DAYS OF CREATION.—By Mr. A. SILVER.

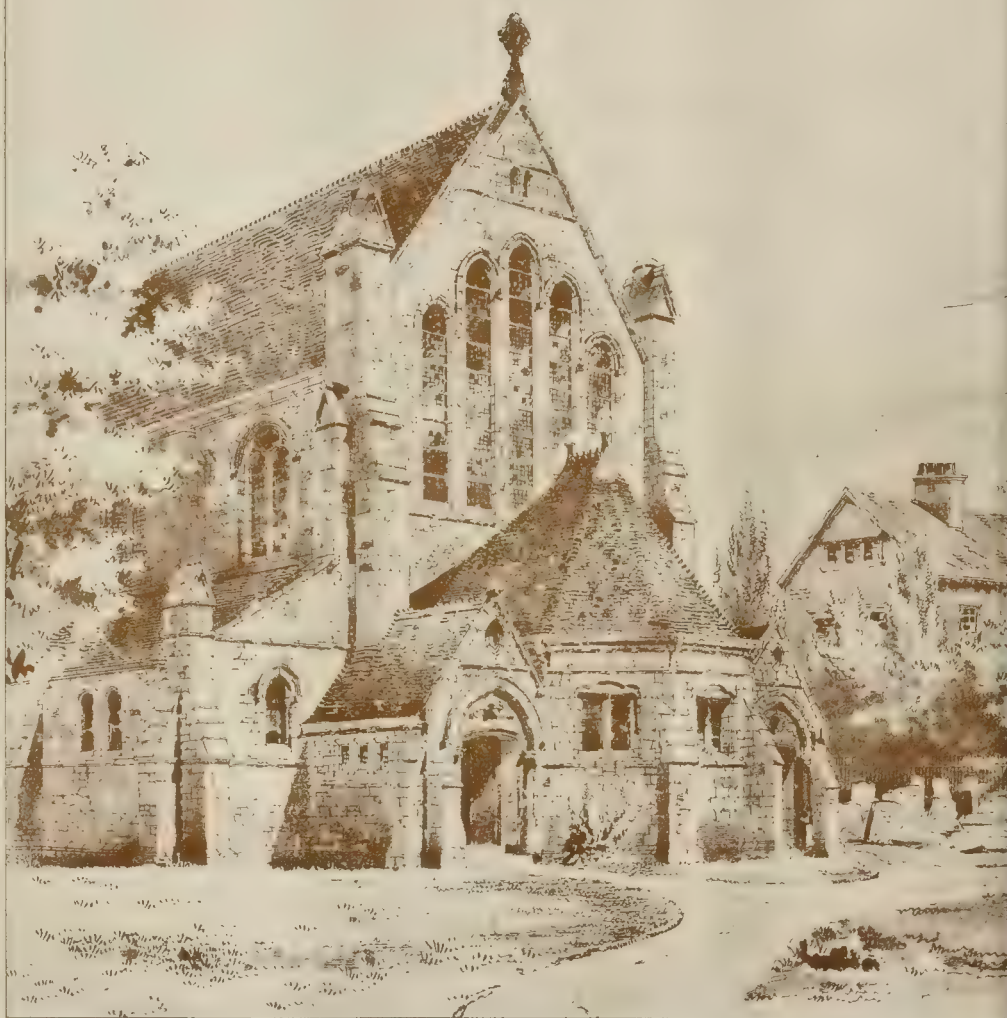








CHURCH AT DULWICH  
EXTENSION OF NAVE  
EDWIN T. HALL, F.R.S.A.  
ARCHITECT



Royal Academy Exhibition, 1893.



"COMPTON LEIGH," FROGNAL GARDENS, HAMPSTEAD.—MR. JAS. NEALE, F.R.I.B.A., ARCHITECT.

Academy Exhibition, 1893.



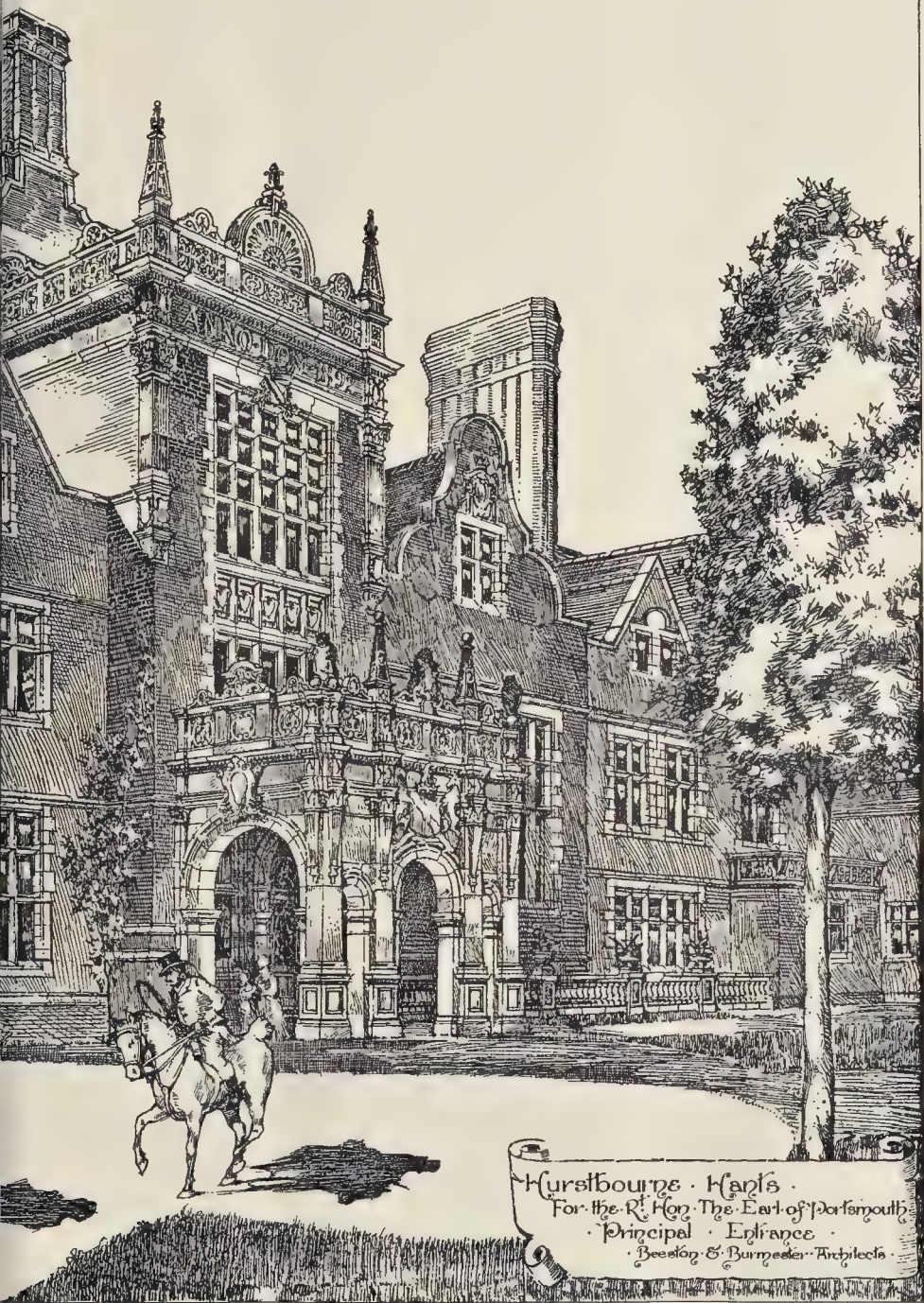








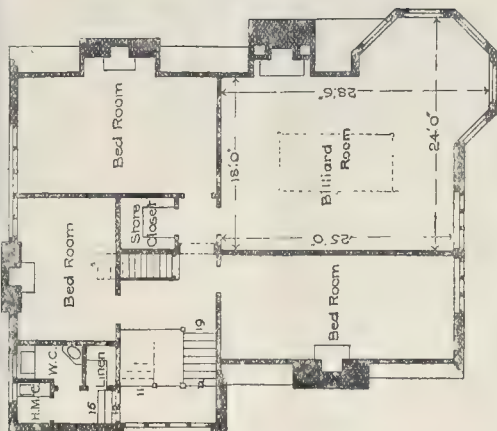




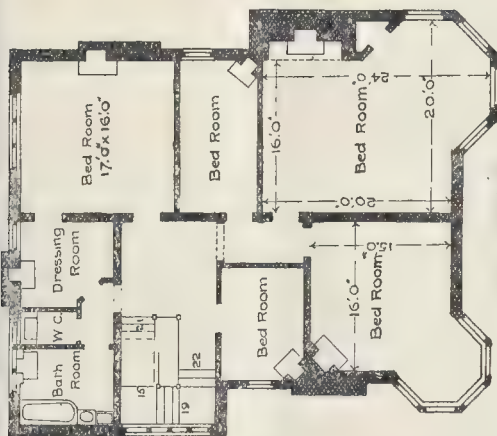
Hurstbourne House.  
For the R. Hon. The Earl of Portsmouth.  
Principal Entrance.  
Beeson & Burmester Architects.







Second Floor.

First Floor.  
"Coulton Lodge," Froggatt Gardens, Hampstead. Plans

Ground floor.

the upper floor has a top-light in addition to the side-windows. The drawing illustrated was exhibited in last year's Royal Academy.

J. N.

## Correspondence.

To the Editor of THE BUILDER.

### THE LATE CÉSAR DALY.

SIR,—In addition to your interesting notice of the late M. Daly, perhaps I may be allowed, from a student's point of view, to join with you in expressing the great sorrow that all who have ever met César Daly must feel at his death, for it was in his untiring sympathy and kindness to young men that he most appealed to me. I first met him, Sir, in the same year as yourself (1889), when I stayed with him at Wisnau. His kindness in the matter of introductions, and his interest in my undertaking (for I had gained the Gates Studentship to the Paris Exhibition), were of the most cordial character, while his enthusiasm for his art, so often dulled as men grow older, seemed to savour more of the young aspirant than of a man eighty years of age. His keen interest in the *Hautes études* of architecture, which, I think, you do not mention,\* was one of his most engrossing topics, and one which he never tired of persuading one to take up at the point where he himself had left off, as he was confident that great good would come from diligent study in this direction.

The Prussians were responsible for more than looting his temporary wine cellar, for they destroyed (probably by lighting their fires) a very valuable collection of his autograph drawings and sketches, for which naturally he said he would never forgive them. The loss to the architectural world of these drawings done by a man who was accustomed to probe to the bottom of things in whatever he took up is apparent.

A man of vast information, ready of wit and anecdote, he never disdained conversing on the most abstruse questions with men far below him in intellectual attainments. He also, to me, seemed to impart knowledge without the appearance of doing so—one of the most seductive qualities which a man can, perhaps, possess.

The dictionary, a great part of which he had written, and which he used to enjoin his son, M. Marcel Daly, to carry on at his death, he endeavoured to float only last year with English capital, but owing to failing health and other reasons it fell through. Although César Daly has gone, the memory of his kindness and friendly forbearance will always remain indelible to any who have had the good fortune to have known him.

BANISTER F. FLETCHER.

### "STAINED GLASS AND DESIGNING."

SIR,—I am obliged to you for finding out who it was who took the liberty of attaching my name, in the way it was attached, to the drawing of Mr. A. Pilkington's window in the Royal Academy exhibition.

Allow me a word more: In your editorial note to my letter in the *Builder* of 20th inst., p. 56, you say that you have a letter from me, in which I "entirely defended the architect's claim to the design in such a case." Kindly print, in your next issue, the exact words of my letter from which you profess to quote, with enough of the context to give the full sense and meaning.

J. MEDLAND TAYLOR.

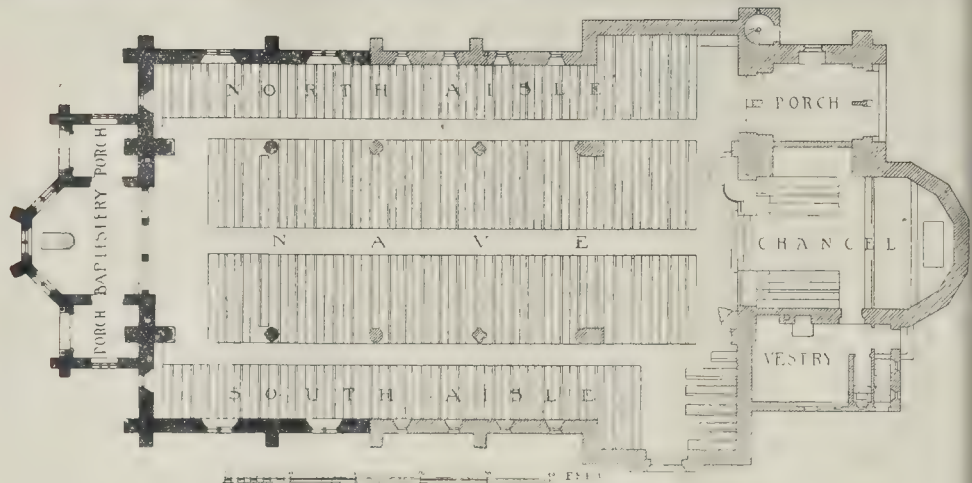
\* We said we received a letter from Mr. Taylor at the time we wrote to him about the drawing, giving expression to the opinion we referred to. We have not the letter now, but we have a very decided recollection on the point, and that we differed entirely from his view, and observed that giving advice about a design was not designing. We may add that we do not see that Mr. Taylor has any ground of complaint whatever against Messrs. Heaton, Butler, & Bayne, for sending the design to the Academy. They sent it as *their* design, which it was, or at all events made in their house. The Secretary R.A. made a mistake in affixing Mr. Taylor's name on the catalogue instead of theirs. It is only since our publication of the drawing that we have learned this. So far from Messrs. Heaton, Butler, & Bayne having desired to make any improper use of Mr. Taylor's name, they seem to have been only actuated by a desire to give Mr. Taylor credit for his supervision, by adding his name to their own on the drawing as the supervising architect.—F.D.

### M. TRELAT AND THE PARIS AUTHORITIES.

SIR—Your Paris correspondent was not fortunate in his endeavours to explain, or rather to justify, the strange doings of the Paris Municipal Council towards M. Emile Trélat and the "École Spéciale d'Architecture." M. Emile Trélat has always been a Republican. He was a friend and a staunch supporter of Gambetta, Ferry, and of all the men

\* We have noticed M. Daly's views on this subject some time ago, in a special article.—F.D.





Plan of Emanuel Church, Dutch, showing additions to Nave, and new Baptistry (see page 72).

who have made the Republic. He is an intimate friend of M. Spuller, the present Minister of Instruction Publique. He cannot be, therefore, but a *persona grata* in a Republican Government.

As regards the "Ecole Spéciale," to which the Municipal Council granted a subvention in 1872, under the form of six scholarships, which number was later on increased up to twelve on account of the services rendered by that institution to the children of the working class, it is still now what it was twenty-two years ago. Only one thing has happened which has altered, not the position of the school, but the feelings of the Municipal Council, and that is that M. Emile Trélat, the director of the school, has been twice returned as a Deputy for Paris, beating hollow each time a Municipal Councillor, *Radical-Socialiste*, and that is what cannot be forgiven to him by the Municipal Councillors, who consider the seats of Parisian Deputies as their own private property. *Inde ire*, and this ire they have generously shown in every way they can to M. Emile Trélat and to his school.

A. CERONI,

Secrétaire de l'Ecole Spéciale d'Architecture.

Paris, January 17.

#### PORTLAND BREAKWATER.

SIR,—As a local individual I felt, perhaps, more than usual interest in reading your remarks in the "Notes" on page 48 of your issue of the 13th inst., respecting the Defences of Portland Roads. And, as my father was associated with the breakwater works here for nearly half a century, I have some little knowledge respecting the details of same. Would you, therefore, kindly suffer me to correct one or two small details? 1st.—The contractors are not Messrs. Hill & Son of Southampton, but Messrs. W. Hill & Co. of Gosport, the senior partner of which was for some years a colleague with my father here when the original breakwater works were in full swing, and Sir John Hawkshaw had nothing to do with the breakwater works at Portland. After the death of Mr. J. M. Rendall, Sir John Hawkshaw's attention was devoted to Dover, and Sir John Coode had sole charge of Portland Breakwater.

With reference to "convict labour having been utilised," for the construction of the breakwater, I may add, that their labour was simply confined to obtaining the raw materials from the quarries; the whole of the other work (carriage, tipping, &c., &c., &c.) having been performed by free labour under the contractors, Messrs. Leather, Smith, & Co.

J. L. BROWN.

#### THE PUGIN STUDENTSHIP.

SIR,—In the report of the Prize Meeting of the Royal Institute of British Architects, Mr. Alexander Graham in the course of his speech says that a question whether the drawings which Mr. J. Paul Cooper submitted were admissible for the Pugin studentship, on account of their being mainly examples of Medieval Architecture in Italy. As this is a matter of serious import to future competitors for the Pugin, I should like to point out that the conditions of the Studentship expressly state that drawings submitted may be either English or Foreign.

J. PAUL COOPER.

#### "HOT-WATER HEATING."

SIR,—It was with much pleasure and interest I followed your articles upon "Hot-water Heating," some little time since. The subject was so excellently and exhaustively treated that no student need fail to master the subject without difficulty.

There is, however, great controversy continually kept up as to the relative merits of "high" and "low" pressure systems.

A discussion in your correspondence column from experienced practical men, and also from those who have studied the subject, would be of great interest, and prove instructive.

I would mention that I have had a great many systems fitted on both principles, and prefer, upon the whole, the "low pressure" when circumstances are equally suitable for both.

When proposals for heating are before public bodies and committees, recommendation of one system or the other must be made, and the reasons stated, and if several engineers are invited to submit schemes and tenders, each will, of course, urge his own as best.

What I wish to see is an opportunity of airing the matter given to advocates of the respective methods, and I think this would fittingly follow your course of instructive papers.

ROB. J. MACBETH.

#### UNREASONABLE DEMANDS OF ARTISANS.

SIR,—In reference to the above, which you were kind enough to insert in your issue of January 13, 1894 (page 34 *ante*), in regard to a letter in the *Builder* of December 9, I am directed by the members of this Branch to write you that such resolution was passed at a full Branch meeting and entered in the minutes of the same, and I am also desired to repeat that the members of this Branch are still of the opinion that such action is entirely opposed to the objects which we should have at heart, viz., the good feeling which should exist between master and man.

I am exceedingly sorry to trouble you again in this matter, but as secretary of the Branch I was unfortunately ill at the time, and unable to attend—hence any informality or incompleteness that may have occurred in the communication you have received.

Secretary, Amalgamated Society of House Painters and Decorators, Westbourne Park Branch.

"PRIME COST."—A letter on this subject, by Mr. H. Riley, we are obliged to hold over, with some others, for want of space.

INCORPORATED ASSOCIATION OF MUNICIPAL AND COUNTY ENGINEERS.—We are pleased to state the seventeenth examination for candidates for the offices of Municipal and Local Board Engineers and Surveyors will be held at the Institution of Civil Engineers, Great George-street, Westminster, S.W., on Friday and Saturday, April 27 and 28, 1894. Intending candidates must send their names on or before March 5.

#### The Student's Column.

#### THE STRUCTURE AND PHYSICAL PROPERTIES OF BUILDING STONES.—IV.

ABSORPTION OF WATER (continued).

RATHER elaborate series of experiments were carried out\* by Professor J. A. Dodge, of the University of Minnesota, to determine the absorption of moisture from damp atmosphere by certain building stones. The samples were placed in the cells of a water bath for several days, to expel their hygroscopic moisture. They were then allowed to cool in desiccators, over sulphuric acid, and weighed. Subsequently they were placed upon a set of glass shelves standing in a pan of water, and a light cylinder was inserted over the shelves, the mouth of the cylinder being sealed by the water, after the manner of a gasholder. The apparatus remained thus in a room the temperature of which was fairly uniform, from 60 deg. to 70 deg. Fahr. for seven weeks, the water being replenished from time to time, so as to maintain a constant closure of the cylinder. Then the stones were removed to bell-jars, in which they were supported over water, and the taken to the balance and weighed.

The determination of the absorption of water by soaking, in the same series of experiments was carried out on samples measuring from 1 to 1½ in. on a side, dried in a hot-water bath to expel moisture. After being weighed they were placed in a large porcelain dish of water, and allowed to soak for four days. The increase of weight at the end of that period is expressed in percentage figures.

The first thing that strikes us on going over the methods adopted by these various observers, is that infinite pains seem to have been taken to produce what we should term unnatural results. As laboratory experiments they are, no doubt, of an estimable character; but when we bear in mind the practical aims of the investigations, we are not entitled to inquire whether some of them, at least, are not ill-advised. There is no objection whatever to the exercise of extreme care in arriving at results; indeed, that is a most essential element. But when we learn that the stones operated upon were placed under the exhausted receiver of an air pump, or were dried at 212 deg. Fahr., and suddenly immersed in cold water, that might be difficult to see were otherwise artificially treated, we may well ask if the investigations really appreciated the practical application of the results thus obtained. We take it that the experiments were intended to ascertain the amount of water the stones would absorb when placed unfavourably in a building; or otherwise there is no point in them. There can be no reason for

\* N. H. Winchell, "The Geology of Minnesota," Vol. I (1892) 117.

\* "Student's Column," January to June, 1892.

ing the stones to absorb more water than they would do under normal circumstances.

We have, therefore, made certain departures in the ordinary methods, in carrying out the tests of absorption to be detailed in these columns. In the first place, the samples experimented upon are all of uniform size as nearly as may be, they are not been subjected to any special heating to swell quarry water, but after being cut and ground have been left exposed for a few weeks in an operating room. That the quarry water had that time disappeared was evident from the constant weight of many samples for several consecutive days. The reason why we did not dry the water out more rapidly is that no risk should run of introducing abnormal conditions, which we feel quite certain must intervene, structurally, the rapid accession of heat beyond ordinary isothermic temperatures. The samples were weighed in the dry state in an ordinary chemist's balance. Subsequently they were placed in water, not distilled, but derived from a water company's main, and the amount of hardness was not excessive. Experiment showed us that no material difference arose in using this, as against ordinary rain water.

We desire to call particular attention to the fact that in ascertaining the ratio of absorption of water, our samples were not completely immersed in the fluid, but were placed in shallow dishes with the upper surface of each specimen slightly projecting out of the water. None of the previous servers seem to have adopted this method in regard to stone, though we believe it is occasionally used in testing cements. There can be no question that it is a more accurate and a more natural way than by completely submerging the samples; the results obtained give a higher value than by the processes commonly adopted. If the sample is immersed, however slowly, so that a column of water stands above it, the pressure thus exerted prevents the escape of air from the pores of the stone, and, consequently, stops the entrance of water therein. Thus the normal absorption is interfered with. On the other hand, by leaving the upper surface of each sample out of the water, the fluid easily penetrates the pores and drives the air before it, which ultimately escapes from that surface. In some specimens the force of the escaping air is sufficient to dislodge particles. It may be thought that this process is practically identical with that in which a water-pump is used, but a moment's reflection will enable the reader to comprehend the difference: in our method, the water enters the stone under normal atmospheric pressure, whilst in the whole of the air cannot and will not be forced out during the entry. All our specimens were placed in the water as described, for one week, the fluid being kept flush with their upper surfaces in addition as occasion required.

In all previous experiments, so far as we are aware, the maximum amount of water absorbed all the information vouchsafed. The reason for this is that the sole object has been to throw light on the comparative durability of the materials operated upon. We need not discuss at matter for a moment; suffice it to say that such more use can be made of absorption experiments than has hitherto been thought. We have regarded ours as a medium of estimating the comparative porosity of stone walls in buildings; and let not the reader imagine that the maximum quantity absorbed is much of an index in regard to this point. We have definitely ascertained that although two given stones may absorb the same amount at the end of a week, yet the rate at which the water penetrated the materials was widely different. In one, total absorption might take place in twenty-four hours, whilst the other might not arrive at totality under five days. Indeed, we have a specimen of sandstone which has been in water for more than two months, and is still absorbing. In face of these facts we have deemed it advisable to ascertain the quantity absorbed by our specimens every few minutes to commence with, then every hour or so, and afterwards every twelve hours.

The results are sufficiently interesting, and show that whilst some rather porous stones are capable of warding off passing showers, others imbibing the same maximum quantity eagerly drink in almost as rapidly as it falls upon them. Thus we hope to shed considerable light on the problem of damp walls. We regard these novel experiments dealing with the "rapidity of absorption" as being of the highest practical value, on these and on other grounds.

Another problem connected with absorption at has received our careful attention is the relative power of stones to imbibe when water is

forcibly directed against them, which does not produce the same results as when they are quietly resting in the fluid. These experiments are also closely connected with damp walls in exposed situations. Conversely, the capability to absorb moisture from the atmosphere had been determined in regard to several of our samples by exposing them to a gentle water spray, under precisely similar conditions.

It has frequently been urged that by obtaining the relative maximum absorption of water by building stones that we are presented with the most important factor in enabling us to estimate their comparative durability. To a limited extent this is, no doubt, a perfectly sound deduction, but we venture to think the principle is, as a rule, carried too far; whilst it altogether neglects some other equally potent factors concerned. The argument is briefly as follows. The moisture retained within the pores of a stone during winter time is occasionally frozen. The freezing operation engenders expansion, and consequently pressure is exerted on the surrounding component particles of stone. These latter, unable to withstand the pressure, their cohesion being endangered, have at length to give way, and minute hair-like cracks are sometimes formed, which become apparent after the thaw has taken place. The stone has commenced to decay or break up. On its surface, where these effects are mostly manifested, it is much more porous than it formerly was. During the next frost, therefore, the decomposition is considerably augmented, and the spaces between the particles and the minute cracks are widened. A number of frosts and thaws spread over a few years complete the destruction, and the surface of the material exfoliates, or crumbles away. The process may be described as one of "physical disintegration."

No one will dispute that this action really takes place. We have abundant evidence of it in the destruction of great quantities of certain free-stones quarried in winter and exposed to the frosty air. The owners of stone mines, from which some of these materials are obtained, are careful, where circumstances permit, to stack the quarried stone underground until finer weather comes; but even then are prepared to pile the same above ground for a further period, until it is "seasoned." We have no intention of discussing the question of seasoned *versus* unseasoned stone; what we desire now is to bring out the fact that one of the chief alterations produced in the stone by seasoning is the drying out of quarry-water—the amount of water the stone has absorbed in its native position. When the stone has become dry, so to speak, it is ready for use. The inference is plain enough, viz., that when built up in ordinary edifices the material will never again absorb as much water as is found in it at the time of quarrying, and this is, no doubt, accurate enough in a general way.

This brings us to the main point of our contention. It is not so much the maximum amount of water that stones will absorb, as the relative *rapidity of imbibition*, and their power of subsequent retention of moisture, that should assist us in gauging their weathering qualities. For, unless the edifice is built in water, with defective damp-courses, the maximum absorption is never reached, in practice.

We should not forget also that the power of physical disintegration by frost is materially controlled by the structure of the stone, its capability of resisting chemical agents, and the rainfall of the district in which the building is situated. The question to be solved is not how much water a stone will absorb at the present time, but how much it is likely to do after it has commenced to decay in future years. We have before us at this moment samples of two stones that have absorbed practically the same percentage of water. From the structure and composition of one of them we feel quite confident that it would rapidly decay chemically, if built up in a large city, and consequently its power to absorb moisture would be proportionately increased; but the other sample is evidently composed of more durable minerals, and its structure is such that centuries must elapse before it would materially decay, or much increase its absorptive faculties. We have just been examining a specimen of Carboniferous Limestone that has absorbed so little water during its week's immersion that the action of frost on it at the present time would be practically nil, it is hard enough to take a fine polish. We know, however, that the stone from this particular quarry, in spite of its hardness, is not noted for its durability, and we should be very much surprised if, after being weathered for a few years, it did not

absorb much more, and decay in increasing proportion.

During the absorption experiments certain stones have slightly disintegrated in the water; we have carefully noted these, the relative quantity detached, and the precise nature of the wasting.

#### GENERAL BUILDING NEWS.

**TRUANT SCHOOL, QUAKER'S YARD, GLAMORGANSHIRE.**—On the 8th inst. Lord Aberdare opened the new Joint Truant School at Quaker's Yard. The school is designed in the Renaissance style. The roofs are covered with green slates, and have corbel courses of moulded and ornamental terra-cotta and bricks over the main part, and are ridged with terra-cotta tile crests. The principal block is two stories high, but it has been necessary, owing to the sloping nature of the ground, to provide under part of the building a basement story. The schoolroom, classroom, and dining-hall, providing accommodation for ninety boys, adjoin the boys' hall, which has an entrance from an asphalted drill-ground, and is separated from the main hall by a glazed screen. A stone staircase communicates with the boys' dormitories on the first floor. These are three in number, accommodating thirty-three, thirty-one, and twenty-six boys respectively. On the first floor, and under the matron's supervision, are sick and convalescent sitting-rooms. Near these, but disconnected, is a room for the reception and isolation of cases of infectious disease. Situated in the basement is the boys' bath-room, containing a large plunge-bath. A lift, fitted up by Messrs. Thomas & Sons, of Cardiff, runs from the basement to the first floor. The laundry, with drying and ironing rooms, is detached from the main building. Against the back boundary of the drill-ground a workshop, large drill-shed (60 ft. long), and other accommodations are provided. The schoolroom, classroom, dining-hall, office, waiting-room, dormitories, sick and infectious diseases rooms, and linen-rooms, are heated singly and collectively by steam. The rest of the rooms have open fire-places. Fire-extinguishing appliances and hydrants are fixed on each floor. The cost of the buildings has been about 6,600*l.*, including boundary-walls and roadways. The architect is Mr. W. H. Dashwood Cople, of Cardiff, whose plans were selected in open competition. The contractors are Messrs. Stephens, Bastow, & Company, of Bristol. Mr. B. Davies, of Merthyr, has acted as clerk of works. The contractors for the steam fittings are Messrs. Barford & Perkins, of Peterborough.

**CHAPEL, PENZANCE.**—The High-street Bible Christian Chapel, Penzance, was re-opened on the 10th inst., after being enlarged and renovated at a cost of 1,000*l.* The architect is Mr. J. Wm. Thompson, of Penzance.

**CATHOLIC SCHOOLS, LINGTON.**—On the 8th inst. Bishop Halsey opened a new wing which has just been added to the St. Gregory's Roman Catholic Schools in Cemetery-road, Lington, Staffordshire. The wing is for the accommodation of boys and infants, and is capable of holding about 500 children. It has been erected at a cost of about 2,500*l.* The architect was Mr. Halliday, of Birmingham, and the builders entrusted with the work, Messrs. Inskip, of Lington.

**PROPOSED NEW SCHOOL FOR EDINBURGH.**—Mr. Wilson, Architect to the Edinburgh School Board, has prepared plans for a new school at Broughton Road, which have received the approval of the Committee on Building. Accommodation will be provided for 398 infants and 550 juveniles, besides which there are a science room, practical cookery room, workshop, gymnasium, and a swimming bath, the size of which is 1,710 square ft. The plans also show how the school can be extended so as to provide for other 358 pupils, namely: 112 infants and 246 juveniles. The same architect has also been instructed to take estimates for the enlargement of Abbeyhill School, by means of which there will be further accommodation for 630 infants, besides which a swimming bath and cookery room are to be added.

**WESLEYAN CHAPEL, BISHOPSTON.**—On the 16th inst. the new Wesleyan church which has been built at Bishopston was opened by the President of the Wesleyan Conference (the Rev. H. I. Pope, of Manchester). In 1890 a building was opened, with a frontage to Gloucester-road, the cost of which, with the land, and a site adjoining, was some 3,000*l.* This structure was intended to be used as a church until the necessary funds had been raised for the building of a regular church edifice, and then to come into service as schools. The structure has now been built from design prepared by Mr. H. J. Jones, architect, of Bristol. The style adopted is of the Decorated period. At the rear end of the church is an apse opened up by a lofty arch, the apse being occupied by a rostrum platform with a projecting, traceried, and carved front in figured pitch pine. On either side of the rostrum and Communion is a shallow transept (north and south) with graduated floors, both the transepts as well as the main portion of the building being fitted with varnished pitch-pine pews. An end gallery is constructed over the front entrance vestibules. The



latter are divided by moulded and traceried glazed screens and swing doors, the floors of the vestibules being formed of encaustic tiles. The main windows are of Bath stone, the heads of which are filled in with flowing tracery, the whole being glazed with tinted cathedral glass. The church will seat 600 persons, the warming being accomplished by a hot-water, low-pressure apparatus, and the artificial lighting by means of brass and decorated iron pendant lights. The whole cost of the two buildings, together with the land, has been about 7,000*l*. The builders were Messrs. R. Wilkins & Sons.

**TOWN OFFICES, LITTLEHAMPTON, SUSSEX.**—New town offices have been erected in Beach-road, Littlehampton. The architect of the new building is Mr. H. Howard. For the exterior a simple treatment of local brick with Portland stone dressing has been used, and the roofing is covered with Broseley tiles. On the ground floor, which is laid with wooden blocks, are to be found on each side of a corridor the offices of the surveyor and collector, and a private room. At the rear are offices and a lavatory, the walls of which are lined with glazed bricks. On the second floor are the board room, 27 ft. 3 in. by 20 ft. 9 in., and other rooms. The contract has been carried out by Messrs. Wallis.

**PRIMITIVE METHODIST CONFERENCE HALL, SMALL HEATH, BIRMINGHAM.**—On the 17th inst. dedicatory services in connexion with the newly-erected Primitive Methodist Conference Hall, Jenkins-street, Small Heath, took place. The building is situated at the corner of Jenkins-street and Arthur-street. It is composed of selected Birmingham bricks, with buff terra-cotta dressings, the accommodation including upper and lower halls, with the necessary vestries, class-rooms, lavatories, cloak-rooms, &c. The upper hall measures 57 ft. by 74 ft., and is 20 ft. high, with a circular end gallery having provision for the choir of forty singers. The communion space and pulpit are centrally placed at the end of the hall. There is seating accommodation on the floor for 325 persons and in the gallery for 450. Mr. Ewen Harper, of Birmingham, was the architect, and Mr. Thomas Rowbotham, the builder.

**BOARD SCHOOL, NEWPORT, MON.**—New board schools were opened at Newport on the 18th inst. The site of the schools is situated in Durham-road. The buildings have been carried out from designs by Mr. Alfred Swash, architect, of Newport, whose plans were selected by the school board in open competition. The external walls are faced with best pressed Star bricks, relieved with moulded buff brick dressings, the roofs having red Bangor duchess slating. Covered sheds are provided in each playground, the latter being asphalted. The infants' school gives accommodation for 320, and is a separate one-story building, in compliance with the department regulations. The girls' school is arranged on the ground floor of the adjoining building, the boys' school being on the first floor, supplying accommodation for 200 boys and 200 girls. The three sections are designed on the central corridor principle, giving access to the class-rooms, which are arranged at right angles to, and at the end of, the corridor. White glazed brick dados are provided in each class-room, the woodwork and fittings being stained and varnished.

**PREMISES, KING-STREET, ST. JAMES'S.**—An extensive block of premises is being erected in King-street, St. James's, for Messrs. Christie, Manson, & Wood, art auctioneers. The building, which is 70 ft. in height, consists of a large hall for statuary, which rises to the height of the second floor, and a series of offices, which, however, are not to be completed for some time. The hall, which is approached by marble steps, and which is 62 ft. long and 20 ft. wide, with a height of 22 ft., has a spacious staircase, and will be provided with oak doors, and finished in oak woodwork, constructed of iron joists and concrete, the iron joists being supplied by Messrs. Lindsay, Neal, & Co. The roofs of the building are flat, and are covered with Claridge's patent asphalt, which is both fire-resisting and water-proof. The front of the building towards King-street is in Portland stone, and is Classic in character, and has been designed to harmonise with a future extension. Sykes' patent drain-pipes have been used in the building, and the floors of the hall and the basement are of wood blocks by Messrs. Duffy. The builders are Messrs. Cubitt & Co., Mr. Williams is the clerk of work, and Mr. T. W. Donovan is the foreman, the architect being Mr. J. Macvicar Anderson. The building is provided with a lift, supplied by the American Elevator Co.

#### SANITARY AND ENGINEERING NEWS.

**DRAINAGE WORKS, Bournemouth.**—The Corporation of Bournemouth have adopted the scheme of the Borough Engineer, Mr. F. W. Lacey, for the extension of the West Cliff drainage outfall at a cost of 7,250*l*.

**NORTH MAIN DRAINAGE.**—The Corporation of Norwich have given the contract for the glazed stoneware pipes, bends, and junctions for this work, which they are carrying out themselves, to Mr. F. H. Brook. The contract includes about ten miles of pipes, from 21 in. to 6 in. diameter. The tender

is estimated to amount to 1,176*l*. 8s. 11d. at scheduled prices.

**SEWAGE DISPOSAL AT IDLE.**—At the Local Board offices, Idle, on the 18th inst., Major-General Crozier, R.E., held an inquiry relative to an application by the Local Board for the issue of a provisional order giving powers to acquire land, by compulsory purchase, at Thackley, for the purpose of sewage filtration works. Some time ago the Board agreed to take their sewage to the Shipley outfall works, on the south bank of the river Aire, at Buck Mill, but the Shipley Board had abandoned their scheme, the Idle Board had to adopt another. They propose to use the land which Shipley discarded, but they had not been able to agree with the owners. With regard to works the Inspector was informed that sanction was required for 4,700*l*., of which about 2,400*l*. would be for sewers and outfall works. Mr. J. H. Woodhead, engineer, stated the case for the Local Board, and the inquiry closed, no opposition being offered.

**SEWAGE WORKS, WILMSLOW, CHESHIRE.**—On the 17th inst. Mr. Arnold Taylor, Local Government Board inspector, held an inquiry at Wilmslow with reference to an application made by the Wilmslow Local Board for permission to borrow 10,000*l*. for purposes of sewage works, and for permission to put in force the Land Clauses Act respecting the compulsory purchase of the land. The Local Authority have already carried out a scheme for their southern district and Fulshaw, and it is now proposed to deal with the sewage in the northern district. Mr. Cobbett, who appeared for the Local Board, said the Board's area was 4,404 acres, and the rateable value 29,750*l*. It was proposed to construct the works on the north side of the river Dean, about a mile from Wilmslow, and the purified effluent would flow into this river. The number of houses that would be dealt with in connection with the scheme was about 520, and Wilmslow authority was summoned before the justices, when orders were made to discontinue turning sewage into the river Bollin within eighteen months, which period would expire about next Christmas. So that Wilmslow was absolutely compelled to dispose of their sewage, and they were obliged to have land somewhere. Mr. J. Bowdon, Engineer to the Board, said there would be no disfiguring element on the land and no nuisance. Considerable evidence was called, and the inquiry then closed.

#### FOREIGN AND COLONIAL.

**FRANCE.**—A new Salle des Séances for the Deputies is shortly to be constructed in the Court of Palais Bourbon called the "Cour de Bourgogne," at an estimated cost of 4,500,000 francs. The Minister of Public Works, in deference to the numerous protestations against the formation of a railway station on the Esplanade des Invalides, appears disposed to choose instead the site of the old Cour des Comptes, on the Quai d'Orléans. At the Ecole des Beaux-Arts the Godebout Prize has been awarded to M. Umbdenstock; the subject was "A wrought-iron grille for the enclosure of a private house."—A Decorative Art Congress will be opened at Paris on May 15.—An exhibition of pictures by J. Guillaumin, the landscape-painter, has been opened at the Drouot and Rue Gallery, and will be open till February 10. The exhibition of Breton landscapes by M. Maufra, at the same gallery, will be open till February 18.—A new high altar of white marble has been put up in the old church of St. Séverin at Paris. It is in Louis Quinze style, and enriched with bronze bas-reliefs reproducing scenes from the life of St. Séverin.—A new lunatic asylum is shortly to be built in the northern suburbs of Paris, which will be the subject of an architectural competition.—M. Desuclles, the sculptor, has been commissioned by the Government to execute the bust of Delacroix, which is intended for the Versailles Museum. M. Emile Delaire, architect, of Paris, has been appointed architect to the town of Issy-les-Moulineaux.—We regret to hear of the death, at the Villa Medici, of M. Mitreux, the gainer of the Prix de Rome in painting for the year 1893.—A monument is to be erected at Grenoble to the memory of Doudart de Lagrèze, the explorer of Cochinchina. It will be executed by two artists of Dauphiné, MM. Recouvray and Ruben, and is to have the general form of one of the pagoda towers at Angkor. On one of the faces will be a niche occupied by bas-reliefs. The two side faces will be occupied by bas-reliefs.—The work will shortly be commenced for deepening the old dock basin at Port St. Nazaire. The cost is estimated at 1,310,000 francs.—The Deputies of the Departments La Creuse and La Haute Vienne, a district which has for many generations furnished the majority of the masons for employed over the rest of France, have been entrusted with a petition to Parliament to permit of the raising, in the Limousin district, of a monument on a great scale in celebration of the mason industry.—The Minister of Public Instruction has decided on the restoration of the Tour du Lycée at Cahors. The tower is classified among the "Monuments Historiques."—A new historical museum is to be

established at Lyons.—M. Petit, the architect, has been commissioned by the Government to build at Alger an "Institut Antiquaire" for the improvement of cures on Pasteur's method.—Ferigoul, the sculptor, has just completed a monument to the Provençal poet Roumanille. The monument, in bronze, is composed of a group of women in Arlesian costume showering flowers before a bust of Roumanille.—M. Colbrant, the late architect, has left all his fortune to the town of Lille for the creation of art-scholarships for young artists of that town, in order to furnish them the means of completing their artistic education at Paris or Rome.—A committee has been formed to raise a monument to Junot at Montbard, in the Department of the Côte d'Or.—The Municipal Council of Castres have organised an international art exhibition, which is to be open from April 15 to June 1st of this year.—The exhibition of the "Union Artistique" of Toulon will open on March 15.—MM. Tony Noël and E. Lormier sculptors, have been commissioned to execute the decorative figures for the museum which is at present in course of construction at Nantes.

**ITALY.**—The Academy of Arts at Milan has put up a memorial to the Vienna architect, Von Schmidt, who was for some time a professor in the architectural schools of this institution. The memorial has been placed in the Palazzo di Brera, and its cost has been subscribed by the former pupils of the deceased architect. Monuments to Von Schmidt are in course of erection at Vienna and at Cologne.—According to our contemporary, the *Deutsche Bauzeitung*, the Medical Congress which is to be held at Rome will be of some interest to architects and sanitary engineers. There will be a subdivision for "genie sanitaire," i.e., sanitary construction, and a Special Committee, counting over four members, will have charge of the management of this part of the Congress.—The discovery of an ancient coin by a child at Salemi, in Sicily, less than 100 years ago, has resulted in excavations on the spot, which have now resulted in the unearthing of the remains of two temples and about 500 graves. The latter contained numerous vases and articles of personal adornment, which have been placed in the National Museum at Palermo.

**BERLIN.**—A small model of Herr Begas' National Monument to late Emperor William has been on view at the Reichstag, whose members will be asked this session to vote the first sum on account for its erection. The special committee appointed to look into the matter has apparently not been very pleased with the design.—This year's Louis Boissonnet Studentship, which is the gift of the Commission of Works, will have to be used by the successful competitor in making a tour through England. Civil engineers have been invited to compete, and the subject they are to take up during their trip in our country is the construction of the large span roofs over railway stations and public markets. The value of the studentship is 100*l*.—The long-mooted Museum island scheme at Berlin is apparently nearing its realisation. A number of old buildings on the island, including the former exhibition buildings which were opened in 1876, are being pulled down, and the demolition of some extensive warehouses is to follow. The banks of the Spree will then be put first of all to rest, and the proposed museums will be taken in hand after completion of these works.—Herr Boetticher has been commissioned by the Prussian Government to measure up a number of interesting archaeological monuments in the Province of East Prussia. The province is full of excellent examples of early German brickwork, which are almost inaccessible to the casual student, which will well repay the energetic student who ventures on a sketching expedition in these somewhat distant parts.

**MUNICH.**—The new Central Produce Market is to be carried out from the designs of the City Architect, Herr Rettig, who designed the market hall for Dresden some three years ago. Herr Rettig cleverly adapted his style to the requirements of the city for which he works; his Berlin monument scheme was in Italian Renaissance, his Dresden market in "Saxon rococo," and now his Munich halls are German Renaissance. According to the *Centralblatt der Bauverwaltung*, in which Herr Rettig's design is reproduced, the proposed works will cost the city about 80,000*l*., for which sum it will obtain a serviceable covered market of 8,150 square metres superficial area. Besides some 4,000 square metres devoted to stalls on the street level, a large number of stands have been provided for in the galleries; and the cellarage is also an important feature in the plan.

#### MISCELLANEOUS.

**THE NEW DORCHESTER CANAL.**—Our contemporary, the *London and South Western Railway*, publishes some interesting data on the new canal from Dorchester to Emden, the works upon which were commenced in the spring of last year, and the opening of which will be of importance to English industry. The canal is designed to be at least the long-felt need of a direct waterway between the West of England coal-fields and the sea. As long ago as 1820 various projects were mooted, but it was not until 1869 that, after numerous alterations and delays, a Bill passed the Prussian Parliament, under the provisions of



by a Royal Canal Commission was appointed, its headquarters at Münster. The canal proper, at Herne, a town in the midst of the coal-fields, about 10 miles east of Easen, lying 182 ft. above the level of the Manchester level, there is a reach to Dortmund, 15 kilometres distant. This reach is 45 ft. above the level of the main canal, and vessels will be raised and lowered bodily by specially-constructed machinery. From here to Münster is a free reach of 67 kilometres, in the course of which are several deep cuttings as well as locks, and the Rivers Lippe and Hever. Beyond Münster commences the descent to the Ems, two miles, and give access to the middle reach, which is 10 kilometres long and lies 162 ft. above the sea level.

The Ems, not navigable at this point, is 100 kilometres below Münster, on an outlet 150 ft. long. The third-lock is situated at Bevergern and at Glessen, and, after a reach of six locks, the canal enters the Ems, 63 kilometres from Münster and 108 ft. below the main level. A short distance below Glessen, the canal leaves the Ems for the already existing Ems, 18 kilometres long, which is to be widened and deepened, the river is regained at Meppen. At this point to Herbrum (48 kilometres), up to which place the tide runs, the river will be canalised, the windings obviated as far as possible by straight cuts. Between Glessen and Herbrum there are the nine locks. A canal, at low-water level, Oldersum to Emden (9 kilometres) is one of the scheme, intended to avoid a large amount of traffic during boisterous weather in the river. The total length of the canal is hence 280 kilometres, of which 185 are artificial. The minimum dimensions of the canal are to be 18 metres width by 2½ metres in depth, and it is intended to accommodate vessels up to 600 tons burthen. The canal above Glessen are designed to hold one vessel the largest admissible type (67 by 8 metres, drawing 17 metres), but those below that point will be only 10 metres, so as to contain a tug and cargo. There will be only two swing bridges crossing the canal, the others all crossing at a mean height of 12 ft. above the water line, and the water supply of the upper reaches will have to be made up by artificial means, a pumping station is in course of erection at the Lippe viaduct, and water is provided along both banks, though it is probable that the motive power will be mainly supplied by tugs. The total cost of the canal and necessary works, including compensation for land required, is estimated at about 3,500,000.

**INDOORS, CANTERBURY.**—The Church of St. Mary Bredin, Canterbury, has just been enriched by the introduction of painted glass in the large window. The window consists of three lights, the subject-matter of the "Ascension," the figures being nearly life size. Messrs. Chas. Evans & Co., of London, W., carried out the work.

**NOTICE OF REMOVAL.** We are informed that Mr. Albert Malland, of Littlehampton, Littlehampton, &c., has removed from 1 and 2, Poultry, to 51, Cheapside, (three doors from Bow Church).

**THE PROPOSED REMOVAL OF CITY CHURCHES.**—The subject, called by the City Church and Church Protection Society, was held in St. Edmund's Church, Lombard-street, on the 17th inst., with a view to an organised effort being made for preserving churches. Mr. J. Biddulph Martin, who presided, said that a movement was on foot for amalgamating the City parishes of St. Edmund's and St. Mary Abchurch, for removing the church of St. Mary Abchurch, and using the site for other purposes. The present gathering was asked to consider what should be taken by the parishioners towards opposing their dissatisfaction with the proposed removal of one of the most common landmarks of the City, and with the suggested amalgamation of the two parishes affected. Absorption had already gone far enough, and the fact that there were actual resident inhabitants in each parish who had the retention of the parish church. The minutes of the meeting thought that the best way of protecting the interests of the parishioners would be to revive the Society for the Protection and Preservation of the City Churches, only varying its name. The subject suggested that the Society should include "restoration" in its scope, and that the word be embraced in the title. He was at a loss to imagine the reason why any of Wren's churches, taken down in the City, should not be erected in one of the suburbs, so that the beautiful work of that famous architect might not be entirely lost. He strongly complained of the spirit of vandalism which prevailed among some of the City rectors. Mr. R. B. Hill, one of the hon. secretaries, read a resolution to the following effect:—"That desirable to revive the Society for the Protection of the City churches, and that it be named 'The Church Preservation Society,' and that its main object be to preserve the City churches from ruthless wanton destruction or removal, by (a) bringing before all the eyes of the people the loss of the ancient and sacred buildings, with a view of offering an organised and vigorous defence against vandalism and ruin; (b) collecting and distributing accurate information on the whole subject; (c) maintaining and defending the rights of the parishioners to the use of their veto on any proposals for the destruction of their parish church." He explained that restoration would be included within the meaning of preservation—part of the Society's title. The Society would desire to stop, by all means in their power, any further destruction of City churches. Since the passing of the Union of Benefices Act in 1860 fifteen churches had been removed, which was at the rate of one in every two years. But from higher powers they were threatened with a measure which would make the operation speedier. A Bill had passed the House of Lords, but not the Commons, giving power to a Commission absolutely to do away with City churches, according as they thought fit, without consulting the patrons or the parishioners; and there was a threatened revival of that Bill. The resolution was passed unanimously.

**WIDENING OF STREETS, SHEFFIELD.**—A meeting of the Sheffield Improvement Committee was held on the 15th inst., when the opinion of counsel as to the powers of the Corporation in the circumstances which have arisen owing to the recent great fire was received and considered. Mr. Macmorran, to whom a case was submitted, gave it as his opinion that any buildings erected on the site of the old buildings will be new ones subject to the existing by-laws, and that the Corporation have power to prescribe a set-back line, subject to the payment of compensation for the land thrown into the street. A resolution was proposed by the Mayor, and seconded by Ald. Bramley, recommending the Council to prescribe a line for the setting-back of the premises which have been burnt, and the eventual continuation of the line from the top of Kings-street, down Angel-street, and along Castle-street to the Haymarket, providing for a width in both streets of 50 ft. The resolution was supported by all the members present with two exceptions. A special meeting of the Council is to be called to take into consideration and decide upon the recommendation of the committee.

**THE ST. HELENS WATER ENGINEER.**—A special meeting of the St. Helens Town Council was held on the 17th inst. to consider the recommendation of the Water Committee that the salary of the Water Engineer to be appointed should commence at 400*l.*, and rise by instalments of 20*l.* until the end of 1900, was reached. Councillor Foote proposed an amendment that the salary start at 300*l.*, and rise by 50*l.* at the end of each two years until 500*l.* was reached. Councillor Hatton seconded. It was pointed out that St. Helens had a large and growing water estate, and new works had to be constructed. The amendment was lost, and the recommendation of the committee was agreed to.

**RESIGNATION OF WATER TRUST ENGINEER, GREENOCK.**—At the monthly meeting of the Greenock Water Trust, on the 16th inst., a letter of resignation was read from Mr. James Wilson, C.E., engineer of the Trust, who stated that he was about to become a partner in the firm of Messrs. J. & A. Leslie & Reid, civil engineers, Edinburgh, but that he would continue in Greenock until the close of the financial year at May 26 next. Bailie Erskine, in moving that the letter be remitted to the Law and Finance Committee, said that while expressing very deep regret at the intimation, they could congratulate Mr. Wilson on the very important appointment he had received. Bailie Cluckie seconded the motion, which was agreed to.

**LONDON STREETS AND BUILDINGS BILL.**—Among the Bills that passed the Examiners on Standing Orders on the 18th inst. were those of the London County Council consolidating the law relating to streets and buildings in London, the Improvements Bill, the Tower Bridge Southern Approach and General Powers Bill, City of London Police, West Middlesex Water, and South-Eastern Railway Bills.

**PUBLIC WORKS IN THE CITY.**—At a meeting of the City Commission of Sewers on Tuesday, Mr. Bridgman, the Chairman, replying to a vote of thanks, reviewed the events of the Commission during the year, which he said had been one of stern and endless hard work. That body was first constituted the sanitary authority of the City immediately after the Great Fire in 1666. The City, without exception, was the best cleansed and the best paved and the healthiest place in the world. During the past year a widening of Upper Thames-street had been decided upon. A plan to widen the western end of Cheapside at a cost of 100,000*l.* was awaiting the decision of the London County Council as to a share of the expense. The approaches to the Tower Bridge were in abeyance for a similar cause. During the last forty years the Commission had expended in improvements 4,254,237*l.*, of which the Corporation and the Metropolitan Board of Works contributed 1,270,789*l.* The artisans' dwellings in Petticoat-square were all filled, the inhabitants exceeding in number 1,000 persons. The cost of clearing the site of the buildings had been 200,915*l.* The sanitary prestige of the City had been well maintained. During the year 608 tons of meat and 221 tons of fish had been condemned, of which the Corporation and the Metropolitan Board of Works contributed 1,270,789*l.* The artisans' dwellings in Petticoat-square were all filled, the inhabitants exceeding in number 1,000 persons. The cost of clearing the site of the buildings had been 200,915*l.* The sanitary prestige of the City had been well maintained. 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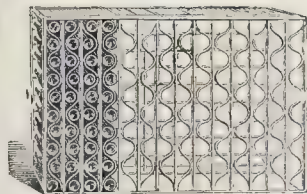
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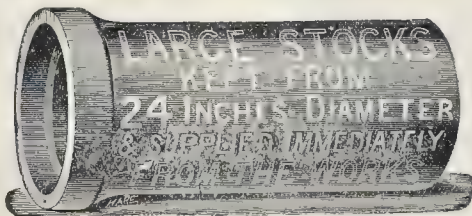
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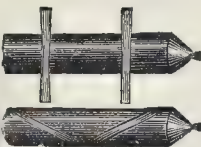
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### Fergusson's History of Ancient and Medieval Architecture.



WHILE Fergusson's great encyclopedic work on the history of architecture remains, in all its essentials, a possession for ever for English students of architecture—for all

students of architecture, in fact, "*sua si bona norint*"—it was inevitable that as time went on, and further discoveries in archaeology were made, some revision should be called for in successive editions of the work. On the whole, we may feel surprised, in this generation of archaeological research, that the necessary amount of revision should be so comparatively small, rather than that some degree of revision should be necessary. In bringing out a third edition of the book, with such notes and alterations as are requisite to bring it up to date,\* the publisher could not have made a better choice of a revising editor than by putting the work into the hands of Mr. Spiers. In regard to the ancient architecture of the pre-Christian era, about which there is most room for speculation and for difference of opinion, and which has been the principal field of recent archaeological research, Mr. Spiers is one of the best-informed men of the day; and while he has brought his knowledge to bear in correcting such of the views of the original author as must now be regarded as doubtful or untenable, he has done this in the most unobtrusive manner possible, mainly by adding foot-notes here and there representing the modified views of the present moment, and the reasons for them, without interfering with the author's original text where this could be avoided.

The most important points in which revision was considered necessary are mentioned in the editor's preface. In Egyptian architecture the accurate measurements of the Pyramids made by Mr. Flinders Petrie, and his correction of Lepsius's theories as regards the Labyrinth, have placed informa-

tion at his disposal which was unknown to Mr. Fergusson. The results of recent discoveries in Greece and Italy have been recorded, sometimes in the text, sometimes in footnotes, and changes have been made in the chapters on Parthian and Sassanian architecture, based on M. Dieulafoy's photographs, which have enabled the editor to correct some of the illustrations copied from Flandin and Coste's work. In the second volume, dealing with Christian architecture, the Byzantine style has been rightly placed first; we always considered it a curious freak of arrangement on the part of a writer mostly so methodical as Fergusson, and who looked at architecture so much from the historical point of view, to have placed the Byzantine style at the end of his Christian volume, giving the reader the sense of going far back again in architectural time after he had been taken through the rise, development, and decline of Gothic architecture. The description of the Mosque of Omar has been transferred to the portion of the work on the Saracenic style. As the editor observes, Fergusson had few supporters in his views as to the origin of this building, which he maintained with characteristic obstinacy in the face of evidence and argument which he should have felt to be conclusive against them. It was part both of the strength and the weakness of Fergusson that he never would give up a conclusion once formed in his own mind. In some cases his persistency was rewarded by unexpected confirmation of his views; in other cases he put himself in the unfortunate position of maintaining, from mere unwillingness to own himself in the wrong, opinions which almost everyone but himself perceived to be untenable. But making all allowance for this, it is wonderful how right he has been, on the whole, in so great a task as giving a summary of the whole history of architecture. Fergusson's description of the probable mode of lighting Greek temples, upon which he especially prided himself, and which was for some time accepted by many Greek archaeologists as the most probable or possible mode of lighting that had been devised, the editor leaves as it was in the text, only adding a footnote giving Dr. Dörpfeld's conclusions on the subject after Mr. Penrose's explanation of the Olympieion and we also observe that the section of the Parthenon given on the title-page no longer

bears the inscription "Section of Parthenon showing the mode in which light was admitted," but is amended to "Showing the author's views as to the admission of light." This was the best way to treat it, for though we cannot now accept Fergusson's view as ascertained or even as probable fact, it was so ingenious, and obtained for a time so much support, that he certainly had a claim to have it permanently connected with his name, as one example of the resources of fancy and suggestion which he brought to bear on architectural history, and which in some cases at least led him in the right direction.

Among the modifications or improvements which have been made in the chapter on Egyptian architecture, the plan of the Hypostyle Hall at Karnak is shaded so as to show the portions actually standing, instead of giving it, as in the earlier editions, as if it were all in existence; and two of the plans of houses discovered by Mr. Petrie at Kahun (one of which, by Mr. Petrie's kindness, was first published in our columns) are added to the plans of Egyptian structures; also the very interesting and unusual plan of the temple at Abydos. The paragraph about the Mammeisi temples and their being the origin of the Greek peristyle temple is left as it originally stood. A note of interrogation might have been put to this, seeing that only one temple of this class of the pre-Greek period has ever been known in Egypt, and that is now destroyed and was never perfect within the memory or record of archaeologists, and its correct restoration is matter of dispute; and we should very much doubt whether the Greeks would have been specially influenced by such a small and unimportant phase of Egyptian architecture, when they had such far grander and more important structures before them. But the fact is that Fergusson had taken the Egyptians, as he did the Hindus, under his special architectural favour and protection, and wished to make out that the Greeks owed everything or nearly everything to them; hence this emphasis on the Mammeisi temple, which seemed to give a "lead" for the Greek peristyle temple. There are other ways of deducing the Greek peristyle temple, none of them indeed resting on ascertainable fact, but certainly more probable than this.

Under the new arrangement of the history,

\* A History of Architecture in all Countries, from the earliest times to the present day. By Jas. Fergusson, D.C.L., F.R.S., M.R.A.S., F.R.I.B.A., &c. Vols. I, and II. Third Edition. Edited by R. Phené Spiers, F.S.A., F.R.I.B.A. London: John Murray; 1893.



Lombard architecture follows Byzantine, and connects it with Byzantine Romanesque; and French architecture is all relegated to the Gothic portion of the second volume, which is its proper place. In the former edition French architecture followed, not very logically, on the first chapter of the Christian architecture devoted to Romanesque work.

In the new edition Byzantine architecture commences the department of Christian architecture, as it certainly should, since it was unquestionably the first new style which arose since the Christian era, the early basilica churches of Italy being only a modification of the materials (both in the aesthetic and in some degree in the physical sense) of Roman architecture. Byzantine is followed logically, in the new book, by "Byzantine Lombard" and "Byzantine Romanesque," which closes the first volume, the Christian architecture of Italy being continued into the second volume; and then we have France, very fully treated, followed by Belgium and Holland, Germany, Scandinavia (which seems to be dragged in here a little out of its due claims), and then English Gothic. We should have preferred to see French and English Gothic placed together and forming the important central portion of the second volume; England certainly has closer connexion architecturally with France than with any other country, and the two together represent Gothic architecture in a sense in which no other two combined countries represent it. The Gothic of Spain and Portugal follows England, and the volume concludes with Part III, oddly entitled "Saracenic and American Architecture"; there are separate chapters or "Books" for each, of course, but this collocation of them in the main title might beguile the ignorant or careless reader into the idea that the author intended to imply some kind of relationship between the two, which he certainly could not have intended; they are merely put together at the end because they are both rather peculiar and out-of-the-way chapters in architectural history, which could not well be connected with any other portion of the book. Saracenic architecture, of course, is peculiar in a historical sense as being, in its finest developments, of no special country, but belonging in turn to the various countries in which Mahomedan rule by turns dominated; like the artillery corps, it went *quocunque fas et gloria ducunt*, and thus had to have its own sub-section of geographical divisions, apart from the general history of architecture in special countries. Its separation was thus necessary; but why couple it with ancient America?

However, this is only a slight remaining deficiency of method in a book in which the method has been much improved as a whole by the present editor, as well as some of the details, without in any way detracting from the merits of the original author or altering the main design and physiognomy of the book. It is still "Fergusson's History" in all its main features, only corrected and brought up to date where necessary by the editor, with a care and industry on the one hand, and an absence on the other hand of all effort to thrust himself in front of the original author, which cannot be too highly commended. We have thus a considerably improved but still perfectly recognisable issue of what is certainly, as far as we know, the most remarkable attempt at a combined and continuous history of the whole of architecture which has ever been produced, and which is a lasting honour to English architectural literature.

RE-OPENING OF GRAY'S INN CHAPEL.—Gray's Inn Chapel was re-opened on the 28th ult. by the Bishop of Marlborough, after having been closed for several months during restoration. The alterations, carried out by the instructions of the Benchers and Master Rose, at a cost of £2,500, consist of a panelled oak roof, open oak seats with carved ends on the floor, and a carved oak screen. During the alterations, which were carried out under the direction of Mr. Shoppee, the architect, two three-light Tudor windows were found embedded in the south wall; these are now left exposed.

## THE EARLIER PARTHENON.

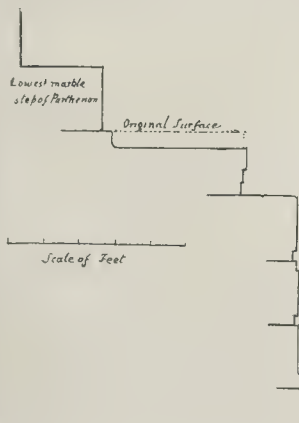
By Mr. F. C. PENROSE.



HAVE read with great interest your leading article of the 13th ult. on Dr. Furtwängler's "Meisterwerke der Griechischen Plastik," and have also, to some extent, looked into the thick and important volume itself: full of suggestive matter. The author of so many new theories, however ably propounded, cannot, I think, expect them all to be accepted without opposition—and I find there is an architectural question to which I feel called upon to raise objection; and that is the theory of the earlier Parthenon. This question, treated as we find it in the volume and most lucidly brought out in your leading article referred to, remains, I think, unsolved by the views we find in that volume, whether after Furtwängler we ascribe its foundation to Themistocles, or, after Dr. Dörpfeld, to Cimon; though I certainly think that, of these two claims, Themistocles has the best of it; but that both are involved in greater difficulties than the older view that this work was pre-Persic.

I have argued the point more at large than I can do here in the "Journal of Hellenic Studies, 1891," which article was answered by Dr. Dörpfeld in the *Mittheilungen*, No. XVII., 1892, to which I replied in the "Hellenic Journal" for last year. I will endeavour to state the more salient facts. To begin with the Archaic temple, the foundations of which abut on the Erechthion site. Of this temple very clear evidence is to be got of its length and breadth. One stone also of its northern stylobate is preserved, having a width of 5.210 ft., and in another part of the Acropolis there are several stones of similar character, which certainly came from the same temple, from which a slightly increased width is obtained—(5.320)—which might have come from the east or west fronts, but more likely from the southern flank. This stylobate and the greater part of the foundation on which it stood, of which much remains, is formed of a stone obtained from a quarry at some distance from Athens—being a better description of stone than the blocks of the Acropolis rock which formed the foundations of the cella wall—but in other respects I could not discover any decided difference of workmanship between them, nor do I see that there is any sufficient reason for assigning a difference of date between the peristyle and the cella. No doubt there are portions of the interior much older than either.

To return to the Parthenon substructions. On the south side, as is well known, there is a massive wall founded on the rock about 250 ft. long and 30 ft. high, the top of which has a section thus:—



which was altered by the Pericleian builders at the western return, but at the east end

retained the original profile. The western extremity of the wall coincides practically with the projection of the Parthenon steps, but at the eastern end is carried about 14 ft. beyond them. Near the north-west corner of the Parthenon the extremity of the western return, running northwards, of the old substructure can be seen. It is on this substructure that the design for an unfinished earlier Parthenon, whether, according to Dr. Dörpfeld, by Cimon, or Dr. Furtwängler, by Themistocles, has to be placed. The columns of that design being, as will be shown, very much crowded in consequence, and having, on the south and east, at any rate, a lower step of very narrow proportion, and with a 6-ft. drop immediately below it on the south side.

There is, however, another explanation of this substructure and of the narrow step spoken of, namely, that the temple itself retired a little from the edge of the great wall, and had around it a terrace of some width, which crowned the substructure walls. In that case, the step found near the edge was the continuation of the step by which this platform was approached from the east, and, perhaps, the west and north also; and, moreover, that the temple itself had already superseded the Archaic temple before the Persian invasion. I must refer the reader, for the ground upon which this restoration of the temple has been founded, to the articles already cited in the "Hellenic Journal," or the "Athenian Architecture" (Second Edition), chap. xiv.; and it is to this temple that we ought to assign the remains of Doric entablature, and most of the fragments of large columns formed of limestone, which remain built into the walls of the Acropolis.

On the other hand, Dr. Dörpfeld's theory, which, in the architectural aspect, is unquestioned by Dr. Furtwängler, is that the remains just referred to were the entablatures of the Archaic temple; but to make them fit the existing stylobates he is obliged to do great violence to architectural analogy and proportion.

The recent thorough examination of the old walls and heaps of ancient material on the Acropolis has produced many valuable records, and amongst them some Doric capitals of large size and formed of limestone, one of them giving the measure of the diameter of the column at the necking as 4.282 ft. This, from the analogy of a series of early examples, should require a base diameter of 5.754 ft. The same researches have brought to light a drum of a fluted Doric column of character exactly suited to the capital referred to, which measures 5.811 ft., which diameter is therefore quite suitable to the cap. I propose to show that such a column is entirely out of keeping with the stylobates of the Archaic temple. We have seen that there are measurements certain of the northern, and highly probable of the southern, stylobate. The mean of the two will be 5.265 ft.

There are several instances of intercolumniations on the fronts of a temple being wider than those of the flank, and that was, we know, the case with the temple to which the entablatures which have been mentioned belonged; for they show by their detail that those on the front were the widest. At Corinth, where this variation also occurs, the columns on the front are also decidedly larger in diameter than those on the flank.\* At the temple of Jupiter at Olympia there seems no appreciable difference in the intercolumniations, but the columns are very slightly thicker, viz., in the proportion of 10181 to 1. At Egina, which, from its date, should give a useful comparison, there seems to be no difference either in the intercolumniations or the columns. These ratios rank as below.

The Heraeum, at Olympia, may be mentioned as an instance where the intercolumniations of the front exceed those on the flank, but the variations *inter se* of the

\* Comp. Vitr. III.,



diameters of the columns hinder any other satisfactory comparisons being made.

	THE ACRO- POLIS EXCA- VATIONS.	CORINTH. AT OLYMPIA.	JULIUS AT OLYMPIA.
Ratio of front and flank columns to centre . . . . .	1'0563 to 1	1'0820 to 1	1'0919 to 1
Ratio of diameters front and flank . . .	1'092	1'0821	1'0821
Ratio of width of column at base . . . . .	—	front 1'111	1'0753

It will be fair, not to say very favourable, to the theory which attempts to adapt these remains on to the Archaic site, to use the example of Corinth in calculating the requisite proportions.

Taking the width of the stylobate on the flanks at 5'265—

The proportion  $\frac{1'266}{1'163} = 1'0894$  = { The diameter of column suited to the flank stylobate.

Then  $4'7164 \times 1'0562 = 4'9815$  = { The diameter of column suited to the front stylobate.

The above is the diameter of the front column as derived from the measures of the Archaic temple, viz., 4'981 ft.

Now take the old remains in the Acropolis wall.

The cap we have seen gives the upper diameter of the column = 4'282.

The mean of nine old Doric examples gives the ratio of 1'3437 for that of the lower diameter to the upper, in which list the example at Corinth enters as 1'340.

Using this latter quantity,  $4'282 \times 1'340 = 5'738$ .

This difference between 5'738 and 4'981, more than 9 in., cannot be conciliated without unjustifiable violence to architectural propriety. Had the calculation been made on the analogy of the Temple at Olympia, the discrepancy would be more than 10 in.

The requirements of the Archaic temple seem to be perfectly satisfied by the discovery of a fragment of a large Ionic capital of limestone, which would fit the known stylobates of that temple. It follows that we are fully justified in seeking another site for the Doric remains, and the site of the pre-Persic Hecatompodon, which has already been spoken of, is obviously the proper place for them. This view is very greatly assisted by some remains of incised marks on that very substruction wall; the measurements of the intervals between these marks have a remarkable relationship with the dimensions of the entablatures referred to. The subject of these marks, and the restoration of the temple which is derived from them, has been discussed at length in the articles in the "Hellenic Journal," already referred to, and also in "The Principles of Athenian Architecture," and to repeat it *in extenso* here would require more space than I am justified in asking for. Whatever theory is advanced on the subject of the earlier Parthenon, those marks must be taken into consideration as facts of importance which demand explanation.

Again, when we come to examine the proposed post-Persic predecessor of the Parthenon, there are serious architectural difficulties to be got over. The profile of the three-facia course which is assumed to be the riser of the lower step on which this temple stood (and, indeed, it is not even a continuous homogeneous step, for near the N.-E. angle of the Parthenon it merges into the rock), has a section differing very much from the ordinary form given to the steps of temples. It is also unusually narrow in comparison with its height, and is composed of blocks which, whilst they have a considerable depth inwards, have very short dimensions (averaging less than 3 ft.) in the running direction of the step. Such lower step would be expected to show its length the other way. This way of laying the blocks is not easy to explain on the post-Persic temple theory, but would exactly suit the cap of the podium on the other hypothesis.

Again, when a second step has been put above it (and if a temple step at all, it is admitted that it must have been surmounted by another) the intercolumniation becomes unusually close, especially in the fronts, where, too, it would be rather less than on the flanks, which is most unlikely to have been thought of. Dr. Dörpfeld, in his arrangement of the plan, has indeed attempted to expand the three middle front intercolumniations by contracting the spaces next the angles beyond all precedent, but there could have been no necessity for such crowding, for a little extra space to the north could readily have been taken.

I fully allow that Dr. Furtwängler has put his case for the Themistoclean foundation of this temple very plausibly, and we are invited to admire the great Athenian's bold innovation in removing the centre of worship to the southern part of the hill; but against this new argument another new line of defence may be erected on the other side. The theory of the orientation lines of Greek and Egyptian temples, giving a key to the dates of their foundation, is certainly sufficiently advanced to be called upon for evidence on such a point as this, and it follows from this theory that this site had been occupied by a temple for centuries before the Persian invasion, and I feel convinced that the old pre-Persic Hecatompodon—the rightful owner of the old Doric Porostone remains, a temple of sufficient importance and magnificence to have superseded the Archaic Ionic temple, and which as the one pre-eminent temple of the goddess witnessed the last and unavailing retreat of the fugitives—was not, indeed, that original, but a successor on the same parallels—all modern theories notwithstanding.

In page 743 of Furtwängler's work there is a passage which has a direct bearing on this question which may be translated thus:—

"Penrose, in 'J. H. S.,' xiii., 32, has attempted once more to defend his view against Dörpfeld. But he has produced nothing that can shake Dörpfeld's result. The decisive point is the explanation of the *Anaklitis* (filling-in) on the south side of the Parthenon. Here everyone who was able to examine the filling-in during the excavation will range himself decidedly on Dörpfeld's side. The streaks of building chips are impossible to doubt. If the filling-in is contemporaneous with the building, the question is settled against Penrose."

This argument, derived from the appearance presented by the filling-in, seems to be relied on as the strongest attack which can be made against the theory of a pre-Persic Hecatompodon, and it must be admitted that if the premisses were incontrovertible, it would be difficult to oppose the conclusion; and no doubt at first sight the argument seems much in favour of the contemporaneous working of the great foundation wall and the filling-in which was laid against it; and it may easily have been that this explanation was accepted by the majority of those who were on the spot at the time of the excavations; but this first-sight appearance, when looked at carefully, seems to me to fail very materially. The contention is that the wall was built without scaffolding, and that as it gradually rose, a certain depth along the side of the wall, equal to the height of one or two courses, was filled in with material which was then thought to be rubbish; and when this was raised to the desired height, additional blocks of the Peiraic stone required for the wall were brought there in the rough, and were worked upon the newly-made ground, and that it is from the chips from these workings that the horizontal streaks of a peculiar kind arose, which show distinctly in the photographs taken during the operations, and which were recognised as building-waste at the time. As these streaks, which divide the more confused layers from one another, run uninterruptedly in lines of very regular thickness right up to the wall, it is also necessary to conclude that the wall, if built contemporaneously, was built with no better scaffolding than could be afforded by this newly-made ground; for if there had also been timber

supports against the wall, the regularity of the layers must have been disturbed. It is their extreme regularity as exhibited in the photographs which defeats the argument. This is fortunately a practical question of which most of the readers of the *Builder* are better fitted to judge than the most learned interpreters of vases and inscriptions.

In my second article in the "Hellenic Journal" for 1892-93, p. 33, I wrote thus:—

"I am entirely at issue with Dr. Dörpfeld in saying that 'the wall was built without scaffolding, but that earth and broken stone fragments were deposited to a depth equal to one or two courses at a time as might be required for building up the wall without scaffolding.' Loose material, such as this, unless consolidated by abundance of water—an element not likely to have been available on the Acropolis—and allowed to dry, would indeed have formed a very poor substitute for scaffolding for heavy work. The photograph—whether that given in page 250 of the 'Hellenic Journal,' or in Pl. IX. of the *Mittheilungen*—does not show much conformity in the thickness of these strata in connexion with the courses of the masonry, but it does show the remarkable evenness of level of the strata themselves. Any architect or engineer who has seen works carried on under at all similar circumstances must have noticed how the ground has been cut up and furrowed by the traction and pitching down of heavy material. I do not express only my own opinion on this point. The thin lines of porous stone chips shown in the photograph and referred to in page 162 of the *Mittheilungen* are quite inconsistent with the explanation there given. Had they arisen from dressing the blocks of the wall, they would have been pounded and mixed in with the general mass of the terrace. These chips, when excavations, may easily have been interpreted by them in the sense quoted; but they offer quite a different appearance when seen in their whole bearing, as in the photograph of the complete excavation—namely, this, that as each layer of earth and other rubbish, as it was then thought, was thrown in 3, 4, or 5 ft. thick as it might be, the top of each surface was metalised, as it is called in road-making, with these stone chips, of which there must have been an abundance on the Acropolis, from the repairs which were in progress, so that the layers might be the more effectually rammed and consolidated. For it was obviously of great importance that this earthwork should afterwards subside as little as possible.

Thirty feet or more of loose earth and broken rubbish would have furnished a very insecure foundation for the timbering required soon after its formation for the great architrave stones of a temple built immediately on the top of the wall."

I may add that it seems probable that the stones used in the building of this and similar walls which are almost all of equable scantling would have been shaped at the Peiraic quarries (the Pentelican drums certainly were scaped into shape), and would only require to be jointed at the "job." Such work would not make enough chips to have formed these streaks. There would be many other operations going on at the time where stone cutting of a more complicated kind was being executed, involving much waste from which the chips wanted for these layers would have been collected.

Connected with this filling-in deposit an explanation is wanted of the presence of a number of Pentelic drums which were found embedded in it. I have explained them as materials prepared by the Peisistratidae for a marble rebuild. But if either Themistocles or Cimon built the wall, intending to proceed to build a marble temple above it, how came they there?

Although I have felt that on this one point there was room to differ from Dr. Furtwängler's view, I must not omit in conclusion to express my great admiration for all else that I have seen of the book and of the article in which you have so ably published a *résumé* of the principal architectural and sculptural points in connexion with the Parthenon.

F. C. P.

THE FAWCETT FIREPROOF FLOOR.—We are informed that the patent for this form of floor has been purchased for the United States for 50,000l., and that it has been used in the Bank of North America, in the State Capitol and Library, and Harrisburg, and elsewhere.

NORWICH MAIN DRAINAGE.—The contract amount for this work should have been 1,776l. 8s. 11d., not "1,176l." as printed in our last.



## NOTES.

**ON** Monday the House of Lords had to consider whether they should agree to the action of the House of Commons in rejecting the contracting-out clause inserted in the Employers' Liability Bill when it was in committee of the House of Lords. They decided to adhere to their clause, and the Bill must go back to the House of Commons. The Government must now choose between passing the Bill with the clause or giving it up altogether. According to all the signs of the times the Government will drop their Bill rather than accept this just and reasonable clause on contracting out. By so doing they will show that they have not the true interests of the workmen at heart, but desire only to seek a party advantage. The House of Lords would let those workmen who wish it make arrangements with their employers, by which the workmen shall run no risk of losing compensation for injuries received in the course of their duty. The Government would force them to go to law, would expose them to the risk of getting no compensation unless negligence was clearly established on the part of the employer or of a fellow workman, and would deprive them of the compensation which can be received under these mutual insurance schemes when the workman himself has been negligent. Moreover, the contracting-out clause is surrounded by all sorts of safeguards to prevent the workman from being pressed into an arrangement against his will, or from being deceived by a bogus fund. If the Employers' Liability Bill does not become law this month, it will be wholly and solely the fault of the Government.

**THE** French Government are being urged to adopt various recommendations tending to render France less dependent upon neighbouring nations for coal, &c. The measures proposed include an extension of the canal system, also a general lowering of rates for French coal by railway, and making it obligatory for railway companies to use only native coal, save in case of exigency. At a debate which took place last week in the Chamber of Deputies, the Minister of Public Works significantly remarked that the output of coal in France must necessarily remain insufficient "until the coal industry inspired more confidence among capitalists." The decreasing returns from many a British industry might well serve to check that inclination to make war upon the capitalists, which is, unfortunately, getting so common. The lack of confidence, which is the outcome of ever-recurring disputes, goes far towards weakening the commercial prosperity of any country, to the injury of capitalist and workman alike. As to the carriage of coal in France, the Chamber declined to adopt an order calling upon the Government to compel reductions, but will endeavour to obtain better terms from the companies by other means. The petitioners were more moderate in their demands in this respect than the ironmasters of Sweden, who recently petitioned the King to reduce freights in that country. They claimed that the carriage of many articles, such as iron goods, both raw and manufactured, fire bricks and clay, &c., should be reduced by from 33 to 50 per cent., while at home we have to fight against advances in rates which were already higher than those in force on the Continent.

**IT** is urged, we believe, by the supporters of that curious mania called the "eight hours' movement," that no loss of production would ensue from forcibly shortening the hours of labour, because the lighthearted artisan, stirred up to unwonted energy by the contemplation of his shortened hours of work, would put as much real effort into his limited eight hours as is now distributed through the longer hours of his present task. As bearing on this subject we have received

an interesting letter from a correspondent in Southport, connected with the building trade, who informs us that his neighbourhood presents an object-lesson in the practical effects of the eight hours' day. For twenty years, according to our correspondent's statement, a forty-eight hours' week has been the rule in his town for building and allied trades. But none of the beneficial results promised from the eight hours' movement have followed in this favoured spot. "There is not more diligence in any given number of hours than formerly. There is not the same output of labour, man for man, per week, as under the old dispensation; one result of this being that tradesmen are driven to a more and more extended use of machinery and labour-saving appliances, in order that they may be less dependent and less under the dominion of the skilled artisans of the day." Such is the testimony of our correspondent, extracted from a long and interesting letter. We should be glad to hear if any employers of labour in the district referred to have any supporting or conflicting testimony to offer on the subject.

**A**n interesting decision was given last week on the Housing of the Working Classes Act, 1890. When a Medical Officer of Health reports that an area is unfit for human habitation, the Local Authority may propose a scheme for the demolition of the existing houses, the owners of which are to be compensated, the amount to be settled by arbitration. Against the certificate of the arbitrator there is an appeal to a jury, provided that leave is given to appeal by the High Court if it is satisfied that there has been "a failure of justice." In the present case the claimants were not satisfied with the arbitrator's award, but the Court would not allow the appeal, holding that a substantial difference between the amount claimed and the amount awarded did not necessarily show a failure of justice. The decision is right; if it had been to a contrary effect every dissatisfied claimant would appeal. The Court, with much caution, declined to lay down any definition of the words "a failure of justice," contenting themselves with saying that they saw no failure of justice in the present case. This was a proper and practical way to deal with the matter.

**A**n appeal has reached us from the Greek Syllagos of Candia with respect to the famous Gortyna inscription. This inscription, it will be remembered, was discovered in 1884, and it still remains on the spot where it was found, exposed to the action not only of the weather but of the water of an irrigation canal, and, moreover, to the risk of destruction by the carelessness or malice of any chance passer-by. A sum of 10,000 francs is needed to buy the inscription and to house it in safety in some more accessible spot. Subscribers of 25*l.* are offered in return a cast of the entire inscription. The object is certainly a worthy one. The inscription has been published with full commentary in the Museo di Antichità, and though it is, perhaps, stretching a point to call it "the most famous of the epigraphical remains of Greek antiquity that have come down to us," still its loss would be deplorable.

**S**OME interesting experiments were carried out at the end of last week at Argenteuil, near Paris, with a new explosive called Schuebelite, which is stated to be wonderfully effective in blasting stone, and to be at least 20 per cent. more powerful than dynamite. The base of the explosive is chlorate of potash, but the inventors have so tamed that dangerous substance as to render it quite safe to handle. After several rifle-firing experiments, comparative blasting tests between black powder and Schuebelite were made, eight charges altogether being fired. Large blocks of stone were selected for the purpose. We need not enter into the

details; suffice it to say that with a much smaller charge, the Schuebelite did more execution than the powder, though the firing was not altogether satisfactory. One of the tests was carried out on a block of stone measuring rather more than 15 cubic metres, when the new explosive broke it in halves, one half falling away, the other being smashed up where it stood into one large and a mass of smaller fragments. Judging from the results, we cannot say that we are altogether impressed with the value of Schuebelite for quarrying purposes. It will be exceedingly useful, no doubt, in mining, and in quarrying igneous rocks for road-metal, where the principal aim is to break up the stone as much and as rapidly as possible. As a means of ridding ragstone and hard overburden it might also do very well; but we are not so sure of its applicability in general quarrying operations. An enormous quantity of rock-powder is annually used in blasting granite for building purposes, and there is a good field open for the introduction of suitable explosives in that direction. The object of blasting the granite is two-fold; first, to split the material up into blocks of workable size, and, secondly, to detach it from the parent rock mass. To produce these effects, a slow-burning explosive must be used, which causes the rock to gently "heave"—to use a quarryman's expression—and to break in required positions. But quick-burning explosives of enormous power shatter the stone too much, and render it unfit for building.

**WE** printed last week a letter from M. Cervoni, Secretary to M. Trélat's "École Spéciale d'Architecture" at Paris, finding fault with the view taken by our Paris correspondent as to the motives of the Paris Municipality in withdrawing their grant from the school, and asserting that this action only arose from political motives. From what we have heard since we are inclined to think that M. Trélat and his secretary are mistaken in this idea. The fact that fifteen of the pupils who had obtained scholarships at M. Trélat's school subsequently went through the long course of the École des Beaux-Arts seems in itself sufficient to indicate that the pupils of the former school did not consider their education completed there; and, we are informed also, that out of 94 scholarship-holders of M. Trélat's school, between 1871 and 1891, only 26 are known as architects. Considering that M. Trélat's is a school where the education is paid for, it seems logical enough, without supposing any political considerations, that the Municipality of Paris should hesitate to continue giving subventions to it under the circumstances. M. Cervoni may of course be right; but it seems to us that the action of the Municipal Council is at all events quite intelligible on other grounds.

**THE** premises of the old Free Public Library in Great Smith-street, Westminster, have been acquired for purposes of the Church House, now in course of erection. The library buildings will, for the present, be used as offices and a hall, the latter having room for about 450 persons. They were formerly those of the Westminster Literary, Scientific, and Mechanics' Institution, founded, in 1840, on a scheme similar to that of the institution established, 1823, by Dr. George Birkbeck in Monkwell-street (disused) Chapel. The Westminster Institution was opened in Little Smith-street, and rented a large lecture-room in Vincent-square. The first members comprised some clerks and workmen of the Esher-street Marble Works, and of Broadwood's piano-manufactory. Then the promoters were able to take a site in Great Smith-street, whereon a lecture-theatre and class-rooms below were erected after the designs of Mr. W. R. Gritten, architect, who gave his services gratuitously. In 1857 the united parishes of St. Margaret and St. John,



being the first metropolitan district to adopt the Free Public Libraries, &c., Act of 1855, leased the premises and equipment of the Mechanics' Institution, which, meanwhile, owing to unavoidable causes, had been closed. Amongst the most active of the Local Commissioners were Lord Hatherley, Dean Milman, and Archdeacon Jennings. Dean Stanley contributed 2,000 volumes, and his sister, Mrs. Vaughan, waived her life-interest, derived from the Dean, in 1,200 more, by giving the books in 1883. A branch library for the outlying part of St. Margaret's was opened (1858) in two rooms at No. 3, Trevor-square, Knightsbridge, where, thirty years later, the whole house with its garden, was obtained, and adapted by Mr. G. R. Welby Wheeler, architect. On August 21, Baroness Burdett-Coutts opened the new library in the same street, erected by Messrs. Stimpson & Co., after the plans and designs of Mr. Francis J. Smith, architect.

IN his own pleasant, but not always discriminating manner, Washington Irving records in "The Sketch Book" a visit he made to Charlelot. After describing the great gate-house, with its flanking towers, and the house's exterior, he takes us through several of the rooms, noting their contents. Of the hall bay-window, which faces an inner court, he says:—

"Here are emblazoned in stained glass the armorial bearings of the Lucy family for many generations, some being dated in 1558. I was delighted to observe in the quarters the three *white lucas* by which the character of Sir Thomas was first identified with that of Justice Shallow."

The proposed sale (as announced in a daily contemporary) of this property, which covers nearly 5,000 acres, in the course of next season, will evoke more than common interest. Sir Thomas Lucy rebuilt the house in the interval between Elizabeth's accession and Shakespeare's birth. It is *U*-shaped on plan, has three floors with gables, four high octagonal turrets, and an elaborated stone porch. The material is red brick with stone quoins and dressings; the style is that of the period. Sir Thomas, who was knighted by Elizabeth, and entertained his Queen here in 1572 on her return from Kenilworth, was descended from William, son of Walter de Cherleote, who took the name of Lucy at the close of the twelfth century, and was founder of Tholesford Priory, near Charlelot. He died in 1600, his wife, Joyce Acton, five years before him. Their alabaster effigies and tomb in the parish church are ascribed to Bernini, who, however, was not born until 1598. Ferne's "Blazon of Gentry," 1586, gives the coat of Geffray Lord Lucy as *gules*, three *lucres* *hauriant argent*. It is always a regretful matter to find a family finally severed from their ancient home, yet the Lucys and Charlelot are so closely associated with a generally credited incident of Shakespeare's youth (perhaps the turning-point of his career), and with the pasquinade and the three or four scenes in which he revenged himself upon the knight, that their united memory will endure until our own language becomes unknown.

WE have received through a well-known architect an amusing and enterprising circular from a gentleman who appears to keep an architectural studio for designing as well as drawing architects' work for them, and expects a great increase in patronage from the fact that he has caught a live French architectural draughtsman, to be kept on the premises and supply the superior artistic finish acquired "in the best Paris studios." It appears that under these fortunate circumstances a London architect has now no occasion to do anything but keep a neat office to see his clients in; all the rest can be done for him on the most reasonable terms. *Ex. gr.*—

"Schedule of charges (subject to 25 per cent. discount for cash on delivery): Planning, designing,

construction, and detailing all classes of work requiring ordinary skill, from rough sketches, 1s. to 15s. 6d. per hour.

*Competitions*.—Mr. . . . is enabled to offer easy speculative terms for various public buildings he is expert in; ordinary engagements, 2s. 6d. per hour. Speculative 1s. nett, with share of premiums if successful.

*Specialty valuable aid* rendered in planning, designing, and detailing, and specifying complete the following buildings, 2s. to 25s. 6d. per hour:—Technical and Board schools, public baths and washhouses, libraries and museums, Municipal and County Council buildings, hospitals and infirmaries, workhouses, factories, warehouses, offices, clubs, hotels and public-houses, houses and bungalows, flats, shop-fronts, &c.

*Details* (practical and artistic) in all trades, 1s. 6d. to 25s. per hour.

*Decorative and colour schemes*: perspectives by a French artist, from 10s. 6d. each.

*Consultations*.—Mr. . . . is open to advising upon and revising competition and other plans, elevations, sections, and methods of construction before same are finally adopted and inked-in—without being otherwise employed—for a minimum fee of 2s. 6d. nett per imperial sheet. Telegrams dealt with immediately; all cases of urgency met by night work."

This is a delicate compliment to the English architectural profession which they will no doubt appreciate at its true value.

IN connexion with the Walsall Union Infirmary competition an architect has forwarded to us a letter from the clerk to the Union stating, in answer to an inquiry, that "the question of appointing a professional assessor is not yet definitely decided, but the probabilities are that one will not be appointed." It may be useful to intending competitors to take note of this.

THE lecture on "Adam architecture in London," delivered at the Society of Arts on Tuesday evening by Mr. Percy Fitzgerald, was a very interesting sketch of the career and work of a remarkable architect, and brought together illustrations (by means of the lantern) of a good deal of Adam's best work. We cannot, however, altogether go with Mr. Fitzgerald in the estimate which he formed of the architectural value of Adam's work. There is a beautiful refinement about his treatment of decorative detail of the class which he to some extent invented, or at least gave his own stamp to, but his designs for exterior façades, "correct" and elegant always, are with a few exceptions tame and cold in conception, and we should be very sorry to see the taste for this very formal style of façade revived, though we admit that something is to be learned from Adam's façades in the way of balance and proportion of parts. And though it may be true that the quality in architecture vaguely called "proportion" (a quality to be felt, but which no one seems able exactly to define) is comparatively neglected in many modern buildings, we cannot agree with Mr. Fitzgerald in considering the Victoria Tower one of these, and we should hardly have the hardihood to suggest that the architect of the Travellers' and Reform Clubs was deficient in the sense of proportion. In the course of the discussion we observed that the name of the architect was referred to constantly as "Adams," although "Adam-street" is just outside the building as a standing correction to this constantly-repeated mistake.

EXPANDED METAL LATHING.—The "British Metal Expansion Company" (West Hartlepool) have sent us a specimen of this, which is one of the best materials which has been devised as a non-inflammable keying for plaster and cement. It is made from thin sheets of the best steel, which are cut into narrow strips by a series of short parallel cuts, leaving a number of connecting pieces at equal distances; the whole is then pulled out sideways (expanded) into a network, the strips being turned in the process so as to present their edges obliquely towards the main plane of the surface. This network of strips of steel on edge makes an excellent key, and the whole sheet being ductile can be bent round beams or girders or wherever else required.

## LETTER FROM PARIS.

It is announced that an exhibition of objects which once belonged to the unfortunate queen, Marie Antoinette, is to be organised at Paris in the month of March, on behalf of a charity. For those who still preserve the taste for souvenirs of royalty and relics of the French Monarchy we may mention one well-known object which will have a prominent place in the proposed exhibition. This is the poor old armchair in Louis Quinze style, in faded crimson velvet, which was part of the furniture of the prison where the queen passed her last days. This chair, which has somehow escaped revolutionary vandalism and the cupidity of tourists, is now preserved in the office of the Director of the Conciergerie, and perhaps may be considered to be one of the most interesting of historic relics of the kind.

This is the time of private exhibitions. That of the Cercle Volney, as usual, opens the list of these small manifestations, in which real art is too often subordinated to the pretentious work of fashionable amateurs. M. Carolus Duran, however, exhibits two fine portraits, and there are others by MM. Bonnat, Benjamin Constant, Jules Lefebvre, and Machard. Among the landscapes the best are those of MM. Damoye, Yon, and Tattegrain; a pretty picture called "Primrose," by M. Raphaël Collin, and the "Pointe du Serail," of M. Bouchor, also merit notice.

There will open shortly, in the Rue Boissy d'Anglas, the exhibition of the Cercle de l'Union Artistique, to remain open till March 6. We may also notice in passing the private exhibition of M. Camille Maufra, whose drawings, heightened by colour, are manifestly inspired by Claude Monet. The pictures are supposed to be representations of Breton peasant character, but the "impressionisme à outrance" of their style is somewhat startling to the spectator who has preserved any vestiges of his critical sanity. Not less so are the landscapes of M. Armand Guillaumin, who exhibits at the Durand-Ruel gallery his ultra-revolutionary productions, which suggest the notion that art is becoming a form of disease, of more interest to the physician than the critic, save for an occasional glimpse of a fine effect of light which may arrest the scroller for a moment here and there.

This year the Champ de Mars Salon, which is generally behind the old Salon, will open its doors first, on April 25 instead of May 15. The large ceiling which the Municipal Council of Paris have commissioned from M. Puvis de Chavannes for the grand staircase of the Hôtel de Ville will probably be found there. The subject of this ceiling is a kind of apotheosis of Victor Hugo. M. Bonnat, on his side, hopes to exhibit at the Champs Elysées Salon his "Apotheosis of the Arts," which will form the principal subject of the decoration commissioned from him for the same building.

Those who attend to-day (February 3) the first official ball at the Hôtel de Ville this winter, will have the first look at the remarkable work executed by M. Georges Bertrand for the decoration of the Salle des Banquets. The painting expresses, in allegorical fashion, the gratitude of Earth to the Sun as the source of life. Two smaller ceilings accompany this principal work. Not far from this will be seen, disencumbered of scaffolding, the ceiling by M. Henri Martin symbolising the Triumph of Apollo. Putting aside the peculiar method of execution which M. Martin has made a speciality, and which is a kind of painted mosaic of touches of various colours, one cannot refuse to this work the praise of fine design and colour and a true feeling for decorative effect. Unfortunately the purely ornamental portion of the ceiling is very weak, especially when compared with the work of the same class, near it, by MM. Galland and Guiffard.

Some days ago the Chamber of Deputies was occupied with the question of the Gare des Invalides, when M. Georges Berger, Deputy of Paris, represented to the Chamber the views of artists and the "Amis Parisiens" in condemnation of the proposal. After a rather animated discussion, the Chamber disposed of the matter in the following resolution:—"The Chamber, convinced that the Government will know how to satisfy the urgent necessities of transport in Paris, without doing any injury to the 'Perspective' of the Esplanade des Invalides, passes to the order of the day." This seem to indicate that, in spite of the numerous complaints that have been made, the end of the matter will be that the station will be made on the Esplanade des Invalides after all, but established among the trees, leaving the Esplanade itself intact.

Parliament has also had before it a proposition



for modifying the proposed reconstruction of the Opéra Comique, by forming the principal façade on the Boulevard des Italiens. This would be the best solution of the question, as it would permit of larger and more convenient exits, while at the same time allowing of a more dignified architectural development. But the houses on the boulevard must be acquired; and it seems doubtful whether the Chamber will vote the money for this additional expense, or will approve of disturbing the whole arrangement now that the competition has been adjudged.

The Government intends to take every precaution to put the scenery and decorations of the Opéra House out of danger from any such catastrophe as that which recently took place. We should have had only to thank the indifference of the Department of Bâtimens Civils if the disaster had been a much more serious and extensive one. It was unpardonable to leave such a collection of fuel in the centre of a very populous district, two steps from the "Folies Bergères," in a street as crowded as Fleet-street or Cheapside, with the addition that in this case the houses, five or six stories high, include numerous residences in flats, as well as shops and stores. The same danger exists in regard to the decorations of the Opéra Comique, which are stored in the Place Louvois and form a danger to the treasures of the Bibliothèque Nationale. All this dangerous material ought to be stored outside the city. The sale of the site in Place Louvois and Rue Richer would go far to cover the expense of new buildings, as well as the loss of the portion of the decorations already burned.

Another important question before Parliament is the rebuilding of the Cour des Comptes, which it was proposed to establish in the Pavillon Marsan of the Tuileries. The Finance Committee of the Senate, on the contrary, wishes to rebuild the Cour des Comptes on the ruins of the old building, placing the Pavillon Marsan at the disposal of the Union Centrale des Arts Décoratifs, which for sixteen years has not succeeded in securing any settled and final place of abode.

The Municipal Council of Paris has just voted the money necessary to complete the *artesian wells* commenced a long time since in the XIIIth Arrondissement, at the "Butte aux Cailles," and in the "Quartier de la Clacière." The works of the construction of the new Boucicault Hospital have at length been commenced. This establishment, in which the latest resources of medical science are to be brought to bear, was the subject of a public competition which was gained by MM. Legros, père et fils, architects, of Paris. The estimated cost is 2,000,000 fr. The hospital will comprise eight pavilions completely isolated, save for intercommunication by basement galleries ("galeries en sous-sol"). It contains sixty-two beds, and occupies 29,694 square metres of land, or 9,000 metres more than the Hôtel Dieu. It will face the Rue de Voulé, in which the principal entrance will be situated.

At the cemetery of Montmartre the monument to Deslises, the musician, who died three years ago, has just been completed. This monument is very simple but of fine architectural character, is the work of M. Jean Girette. It is placed not far from the tombs of the painter Gruze, the musician Victor Massé, and the poet Henri Murger. It consists of a stone stele about five metres in height, at the foot of which is a lyre with broken strings, over which are cast flowers and pages of music, containing brief quotations from the compositions of Deslises, the names of which are also sculptured on the side faces of the stele, which is crowned by a small pediment containing a remarkably fine medallion portrait of the deceased musician by M. Chaplain.

We regret to add that the friends of M. Cavalier, the sculptor, are very uneasy as to his state of health, though he was believed to have recovered from the effects of his recent accident. We may remind the reader that it was to this sculptor, who has now attained the venerable age of eighty-seven, that we owe the fine statue of Francis I., in the Cour Louis XIV. of the old Hôtel de Ville, where it made a pendant to that of the "Roy Soleil" by Coysevox. These works fortunately both escaped the Communal flames, and are preserved in the Municipal Museum at Auteuil.

THE MASONIC LODGE FOR ARCHITECTS AND SURVEYORS.—More than fifty members and visitors attended the third installation meeting, at Freemasons' Hall on the 24th ult. A banquet followed the business, and some music by Messrs. F. Bevan, Dalzell, and Coward.

## THE ADVANCEMENT OF ARCHITECTURE.

ROYAL ACADEMY LECTURES BY PROFESSOR AITCHISON, A.R.A.—LECTURE I.

MR. PRESIDENT, students of the Royal Academy, ladies, and gentlemen: I began to prepare a course of lectures on Romanesque, the diagrams on the wall will show you how far they had progressed, but though I still think that the study of Romanesque is valuable, in showing us how the savages who overran the Roman Empire progressed in architecture, I became convinced that a continuation of last year's lectures might be more useful. I said something about the value of architecture to mankind in my last course of lectures, but I shall go over the ground again, for, unless students are convinced of the importance of their profession to mankind, they will hardly be impelled to give that time, energy, and devotion to its study, that its merits demand. I use the word devotion, to express the frame of mind that each student should bring to the study of architecture, in the hopes of advancing it for the benefit of mankind. A devotion that must not look to profit, honour, or fame in its pursuit, and only for that meed of pleasure which is spoken of by the poet, "there is pleasure in poetic pains that poets only know." Actuated by this devotion, which is at once benevolent and patriotic, he will emulate those philosophers who devote their lifetime to the examination and recording of some phase in Nature, which it is probable someone else will use.

The architect is even less fortunate than the poet, for it is a rare case when the poet cannot get his poem published. It is, however, common enough for the accomplished architect never to have anything to build which can show his skill; for should he be greatly in advance of his age, it is almost certain that any drawing or model he presents for approval will not be accepted.

The higher energies of mankind are now mainly devoted to the elucidation of the problems of Nature, and particularly to that grand problem of the ultimate atoms of which the universe is composed. These speculations were almost entirely abandoned during the early days of Christianity; necessarily in the dark ages, and during the enforced ignorance of Medieval days.

Since the revival of learning, philosophy has again started from the speculations of the Greek philosophers, whose last exponent was Lucretius, about 55 B.C. The modern philosopher however has all the new sciences, chemistry, light, heat, and electricity to help him, as well as apparatus that more or less enables him to verify his hypotheses.

As "ignorance is the curse of God, knowledge the wing wherewith we fly to heaven," we should be grateful to the philosophers who pursue their profound studies with no hope of reward but the knowledge they gain, and who have shown us that Nature proceeds by unflinching and unswerving laws, and that all we can know is from the investigation of our universe. Such studies, however, should not so completely absorb the best energies of all the greatest of mankind, as to entirely turn away their thoughts from other things which should ennoble and delight mankind.

Some consideration of our universe is good for all, as a set off to man's overweening pride. It is good to be occasionally reminded that to our universe, man resembles the animalcule in a drop of dirty water. Still, it is not good for man to wholly dwell on his own insignificance, as it is too apt to make him regard his actions as of no importance.

That an ant should appropriate to his own use a grain of corn, which it ought to take to the common store, does not seem of much importance to us, nor to the world; though it is of vital importance in an ant-hill; and our ant-hill is this earth.

As regards man, it must still be affirmed that "the proper study of mankind is man." Any thing we can do to discipline, raise, and delight him with ennobling pleasures, is of more importance than to know the conformation of the circumambient ether. I consider that the triumphs of architecture do afford such ennobling pleasures to mankind, and I wish I could say with Sir Henry Wotton, that "Architecture can want no commendation where there are noble men or noble minds."

No one can expect to thoroughly appreciate even the outside shapes of fine buildings, without having some cultivation or some natural susceptibility to beauty.

Although it may appear scarcely credible, yet it is true that there are people who are unaffected by the beauty of inanimate nature, and we can scarcely expect such persons to be affected by archite-

ture; though this may not always be the case, as man, cultivated or not, is mostly more affected by the highest and most enduring efforts of man, than by the works of Nature; for the one implies genius, knowledge, skill, power, and wealth, and the other seems but the spontaneous action of necessity. Those who do observe and admire the beauty of shape in rocks and mountains, in the sea and its shores, in trees, plants, herbs, and flowers, would naturally admire the fine shapes of buildings. I should not like to affirm that fine buildings, even the most beautiful, exceed in beauty the finest things in Nature, though I think they do; but they certainly bring home to us their relationship to man in the most charming and delightful way, and in a way that natural objects do not, however striking or beautiful they may be. When you see fine buildings in the midst of Nature, it is like hearing your native tongue spoken in a foreign land. In walking on the other side of the Thames by Cookham, you see a succession of all the beautiful and varied forms of the upper woods of Cliveden, and amidst them the outline of a pretty little pavilion, which goes to your heart at once, for it is man's work. In some respects, too, man's larger works exceed those of Nature even in size, for, as Mr. Ruskin has pointed out, there is no sheer plane in Nature that equals the front of a large building. In that pinnacled plain near Amalfi, that at a distance is taken for a Medieval town, the biggest rocks seem much smaller than Gothic Cathedrals.

I believe the same is true of towers. There is no square isolated mass of rock that equals the bell towers of Italy, for though at Orkney the "Old Man of Hoy" is said to be 600 ft. high, it is but a ruin. The effect of that mountain at Utah that is called the "Western Temple of the Virgin Valley" is said to surpass all description; and, of course, Nature can deal with heights and masses that dwarf to insignificance the puny efforts of man. Yet Nature's chisels, heat, frost, wind, rain, and lightning, do not carve the mountains into shapes as dear to us, as those forms which the genius of man has erected for our admiration. Blind force, acting for ages beyond count on dead matter, can never excite the same admiration as that due to high intelligence working for man's delight. Hints, however, for all sorts of forms, and all sorts of arrangements, are culled by genius from Nature's works, but experience alone can show that these hints, when worked up, produce the desired effect.

We can never separate the visual effects from the mental rebound, that tells us whether these things have been done by man to raise emotions, or are but the outcome of blind necessity. Still we can only learn from Nature's and from man's works; and, as Nature's are the grandest, we get from them the rough-hewn sources of emotion, while from buildings we learn the devices for producing such emotions in less gigantic works. Height, vastness, and gloom, and the sudden change from dark to light, affect us all, whether they be produced by Nature's hand or by man's. Yet the thought of the power and originality of so small and feeble a creature as man, does much to enhance the value of his colossal works. Various and striking are the effects, and innumerable are the beauties that can be seen in Nature, and that can, by the efforts of genius, be used in man's work. Most persons when they look from a sunlit glade into a forest are delighted by the view of the numberless and vast branchless boles, gradually lost in grey obscurity; there is always a thrilling feeling of sublimity, in looking from the light into the impenetrable darkness of some cavern's mouth, and both these motives have been seized on and utilised, the former in the porticoes of Greek temples, and the latter in some of the vast porches of Gothic cathedrals, Coutances perhaps affording the finest example.

In architecture there is a recurrence, a symmetry, a rhythm, an ordered alternation of light and shade, of flatness and projection, and a delicate proportioning, that produces in us a calm feeling of delight; there are, too, the repeated alternations of contiguous light and shade that excite the eye, contrasted with smooth surfaces that give it rest, and in the occurrence of varied and contrasted forms, that make the æsthetic part of architecture particularly taking; but it is a vague and indefinite delight like music without words; but, as far as I can recollect, very few writers have noticed this special æsthetic charm. M. de Stiel is one of the few writers that felt this charm. There is a passage in his "Corinne" that well expresses it, and that is almost unique in literature. When Corinne is standing by one of the fountains of the Piazza, and



looking at St. Peter's, she says:—"Painting and sculpture mostly imitate the human form, or, at least, some object in Nature, and, therefore, awaken in our soul perfectly clear and positive ideas; but a beautiful monument of architecture has not, so to say, any determinate sense; in contemplating it, one is overcome by that reverie without calculation and without aim which leads the thoughts so far. The sound of falling waters induces the same vague and profound impression; it is as uniform as the building is regular. 'Eternal movement and eternal rest' are thus brought together. In this place, above all, time is without power, for it no more stills these gushing waters than it moves those motionless stones."

Architecture, however, tells other tales besides producing vague emotions of delight; it tells of a nation's desire to perpetuate by monuments its feelings of adoration, its admiration for the glory it has achieved or the grandeur it has attained. These desires have in past time evoked the genius of the architect, and have enlisted the labour of the thousands of toilers, to embody his conception in hard and ponderous materials. Every vast monument expresses the desire of a nation to devote some of its earnings to the embodiment of an ideal, or at least its contentment that this should be done; for no tyrant exists, or ever has existed, except by the acquiescence of the bulk of those he rules. The heavy tax laid by Justinian on Constantinople to build St. Sophia, at least shows his people's acquiescence, or he would have been hurled from the throne. A philosopher says, all the reward and immortality of the unknown labourers at the Great Pyramid are enshrined in its stones.

Architectural monuments not only keep alive the memory of dumb nations; for without them what would now be known of the greatness of Egypt, Assyria, and Persia? But their monuments afford a measure of their wealth, power, and greatness; and give us the most concise compendium of the cultivation they had reached. It is, therefore, of the utmost importance that architectural monuments, besides their impressiveness and grandeur, should express their taste, feeling, and skill of the nation at the time of their building, and not be copies or paraphrases of former buildings. We should be as proud of what we can do, as Touchstone was of his bride: "An ill-favoured thing, sir, but mine own . . . for rich honesty dwells like a miser, sir, in a poor-house, as your pearl in your foul oyster." However admirable the architecture of former times, of other people, or of foreign climes, may have been, I trust that neither the architect nor the people want to be like the "jackdaw with the peacock's feathers"; but, besides this, if the architecture we paraphrase was of other climes, it cannot be proper for this climate; if it was that of other nations, it cannot exactly represent what ours should be; and if it were of former times it would still not represent what we now feel or most admire.

A passion for the newly-advanced geometry was one of the characteristics of the Saracens and Medievals, but now, nothing can be more nauseating in the imitation Gothic of the day than the geometrical figures with which it is overlaid; for these only remind us of a child's efforts with a pair of compasses. If there is no desire for beauty in the people, and no original skill in the architects, it is at least honest to have a dead wall with holes in it, than the most brilliant fancy dress, in imitation of other tastes and other times.

Some day, when investigators have found out the diagnosis of architecture and sculpture, the capacities of a nation will be as clear to them from its architectural remains, as the shape of an extinct creature is to an anatomist, from the fragment of its bones. Most of us have wondered what the minds of the barbarians were like, who carved on their churches those ornaments, that look like the flock of geese Baron Munchausen captured with his line and eel.

The obtrusiveness of architecture is another of its characteristics, and not the least important one; buildings are not like books, statues, pictures, or musical instruments, that can be hidden away. In towns they meet us at every step, and compel some attention, even if it be but momentary. However small buildings may be, they take from us some light, some air, and the prospect; so they are not merely to be looked on as useful things for the occupier, but as things that owe everyone a debt for what they have deprived him of, and must be made sightly, if not comely. There are, however, exceptions to this rule, in the case of erections built

by society to awe or terrify us, like police-stations, law-courts, prisons, and the gallows. Those buildings which dominate towns, and have been built for some noble or grand purpose, should declare their use. It is needless to point out their obtrusiveness, when astronomers tell us that if our side of the moon be inhabited, it is not by a race of great builders, for the telescope would reveal anything built there that was as high and as big as St. Paul's.

The building of a vast structure, even of an immense forest, involving a forest of scaffolding, huge heaps of material, and thousands of workmen, naturally impresses the people; so we read, in books of the time, of the domes of St. Sophia, Sta. Maria del Fiore, St. Peter's, and St. Paul's being called "mountains." We must consider, too, the effect that vast and magnificent buildings have on foreigners, and the notions they get from them of the greatness and civilisation of the country, not to speak of the wealth, magnificent buildings bring by the influx of visitors. Vast and magnificent buildings possess another power, which is not, however, pleasant to contemplate; the sort of limited immortality they confer on great nations that have perished. Even the ruins of such buildings speak of its former wealth, greatness, and cultivation, and engender visions and regrets; as well as affording permanent records of the place where the great nation had its home. Books, pictures, statues, and other moveable works of art become either the property of the world or of the nation that possesses them; it requires an effort of the mind to refer them back to their native country, but the ruins of fine monuments fix the locality, and cannot be dissociated from the place. The mind, too, seems more ready to transfer the isolated works we have seen elsewhere, to the buildings we are contemplating. The ruins, too, of fine architectural works form a school for the barbarians who have settled there, and may eventually be the foundation for a new style.

Every building is so intimately connected with man, that it must be noticed by the poet, the writer, and the painter; for, except in the cases of battles, some building mostly forms the background to the most striking actions of man's life. Besides, the importance, the grandeur, the beauty, or sublimity of monuments has always made them favourite subjects for introduction by the painter and the poet. It would be difficult to find a poet not purely pastoral or didactic, in whose works admiration for fine buildings is not expressed, from Homer's description of the metallic palace of Alcinoüs, to the Palace of Art of the late Poet Laureate, though he unfortunately lived in the days of the Gothic revival.

The great poet of the Middle Ages, Dante, was born in 1265, just after St. Lewis was defeated and taken prisoner in the 7th Crusade.

Considering that Gothic was invented less than a century before Dante's birth, one cannot help thinking that, had he been much in France, he must have been forcibly struck by the wonderful buildings in the new style, and have written about them, even though his model, Virgil, took little notice of architecture. The great progress then made in Italy was, however, in sculpture and painting, and these were evidently the arts he mostly admired, for he composed in words charming groups of sculpture for the walls and pavement of the ascent to purgatory. He was, however, such a keen observer that he makes a simile of the burdened souls in purgatory from a corbel—

"As, to support incumbent floor or roof,  
For corbel, is a figure sometimes seen,  
That crumples up its knees unto its breast;  
With the feign'd posture, stirring ruth unfeigned  
In the beholder's fancy: so I saw  
These fashion'd, when I noted well their guise,"  
(Purg. Can. 10, l. 130-135, Carey's Translation.)

Chaucer, however, our fellow townsman,\* who was born in 1328, seven years after Dante died, and who lived till 1400, was both an observer and an admirer of architecture, and describes buildings in many places rather minutely; and though his English is occasionally difficult to understand, and his verse quaint and rugged, there is a charm about it, so I give you his description of the House of Fame:—

"All was of stene of berle,  
Both the castell and the toure,  
And eke the hall, and every boure,  
Without peeces or joinynges;  
But many subtil compassings,  
As habewinnes and pinnacles,  
Imageries and tabernacles,  
I saw, and full eke of windowes,  
As flakes fallen in great snowes;  
And eke in each of the pinnacles  
Weren sundry habitacles,"  
(Chaucer, "House of Fame," Lib. 3, v. 93.)

\* He is said to have been a Londoner.

I may say that "babewinnes" are baboons; the writers of the Middle Ages irreverently called grotesque Gothic sculpture and painting "baboon work."

The architectural descriptions in the poets, even including Wordsworth's "Vision," mostly contain only a few vague terms, costliness of material mostly doing duty for beauty of design; which, after all, cannot be properly dealt with in words. Milton's language is, however, so sublime, that we can well bear his description of Satan's golden Renaissance palace:—

"Anon, out of the earth a fabric huge  
Rose like an exhalation, with the sound  
Of dulcet symphonies and voices sweet,  
Built like a temple, where Pilasters round  
Were set, and Doric pillars overlaid  
With golden architrave; nor did there want  
Cornice or Frieze, with bossy sculptures grav'd.  
The roof was fretted gold."  
—Milton's "Paradise Lost," Lib. 1, v. 710.

If all the architecture were to be erased from sculpture and painting, and blotted out of literature, what gaps would be left in pictures, bas-reliefs, and books; think how bald even the Arabian Nights would become, without the architectural surrounding of the stories. So I think we may consider that architecture fills a good space among the achievements of mankind. Is it not well worth the devotion and striving of the architects, and the aspirations and efforts of the students, to put it once again into the way of improvement and progress? Although Architecture now brings no honour, glory, or fame, mankind may again turn to admiring it, as at former epochs. Future architects may become as famous as Ictinus, Callicrates, and Mnesicles, as Anthemius of Tralles and Isodore of Miletes, as Giotto, Brunellesco or Bramante, as St. Gallo, Palladio, or Wren. We must, however, admit that Milton was right when he called fame "that last infirmity of noble mind," for truly the world has received as much instruction and delight from the work of nameless Roman, Gothic, Saracen, and Renaissance architects, as from those who stand in the temple of Fame.

Building we could scarce do without, to protect us from the weather, and from robbery, to stow our goods in, or to work up our materials, unless we fell back into primitive savagery. If we pretend to any culture, we want our commonplace buildings to have character and comeliness, and those for noble purposes to raise strong and adequate emotions, for if all buildings were wholly and purely utilitarian, it would be like exchanging oratorios of the great composers for the din made by the rivetting of iron ships.

All the fine arts are necessarily progressive, but their strongest appeal to us is when they portray the emotions of the day. Sir Walter Scott pointed this out in his Waverley novels; he said that he had made all the accessories as true to the times he could, but not the personages, for had they represented the real persons, no one would have cared to read the novels. To make his personages interesting they spoke, acted, and thought like those of his day; and this is true of every fine art. There was a simplicity, a directness, an intensity, and a dignity about all the historic personages of Greek times, that has made antique poetry, eloquence, sculpture, and architecture unsurpassed, and possibly unsurpassable. The artists, and, under this name I include the poets, of to-day have to deal with people who are feeble and less dignified, but more varied and complex than the ancients; but now, as then, existing personages must be the actors, and must be made like life, or their works must appeal to present emotions, or they do not interest us. As long as noble qualities, character, and beauty exist in nations, I believe there will always be artists to express them. The art of expression is mainly learnt from the past, but the artists must be animated by the spirit of the present. The cause of Tennyson's works being so highly valued, and so widely spread amongst the English-speaking race, is, apart from their harmony and beautiful diction, due to their being imbued with the knowledge, thoughts, feeling, and aspirations of his day. There have been times of brutal barbarism, there have been times of villainess, corruption and cowardice, that could give rise to no poetry. Architecture only deals indirectly with man, it has to meet some of his necessities, habits, and artificial wants, and aesthetically to move those emotions that are proper to the uses of the building.

If any fine art had ever arrived at a perfection, that would be appropriate for all purposes and for all time, that art would be done with, there could be nothing more to express, and we could but apply the stereotyped form to what we want. This perfection has by no means been reached in



architecture, it is difficult to see how it ever could be arrived at, while man's wants and knowledge progress, and his tastes change; though unhappily we too often act as if this were the case. We have many new necessities, thousands of new wants, and many new materials, that must have new proportions, and somewhat new forms, and certainly new methods of construction; we have new beliefs, new knowledge, and I think I may safely say new hopes and new aspirations, though these hopes and aspirations may be vague. It can hardly be said that we have availed ourselves of all these changes from the past, though we may be slowly working to bring about a very different order of things in Architecture. Those who are familiar with the ways of Nature know that the gradual subsidence or the gradual elevation of parts of the earth's crust are usually too small to be observed until the lapse of centuries. All we can say about Architecture is, that it has received in our time no sudden and immense development; it has not been affected by one of those tremendous volcanic eruptions that has suddenly changed a level surface into a mountain, like that, which in Renaissance days, filled up the Lucrine lake.

In the very early Renaissance days there were apparently but few architects in Italy, and the scholars, antiquaries, goldsmiths, painters, and sculptors, thought they had found perfection in ancient Roman architecture, and in the precepts of Vitruvius; in consequence Architecture then ceased to be a progressive structural art. We have not altogether shaken off this Renaissance fallacy, although we have several times changed the model. Greek, Gothic, and the Dutch Renaissance have successively been held to be the acme of perfection.

My object is to consider if Architecture can get into a progressive state again, and if possible how it may be done.

I could fill the whole of my lectures with the facetious diatribes of non-professional writers against modern architecture and architects, if I thought any benefit would be gained by so doing. All architectural archaeologists know the slow evolution of the different architectures, now called "styles"; an evolution that it has mostly taken many centuries to effect; yet these critics write as if they thought it was mere sloth or perverseness, that prevented clever men from inventing new styles in an hour, a day, a week, or a month. So the main use of such quotations would be to show the critic's ignorance, and even if it showed a real and earnest desire in the country for something new, it would only illustrate the theory of political economy, that it is the supply that creates the demand and not the reverse.

We must, however, admit with due regret that as yet there is no architecture in Christendom that in our eyes can be called good, true, and distinctive of the present century.

All those engaged in rapidly progressive fine arts, have treated with contempt the work they have surpassed, as men of science do exploded theories. The Greeks at their apogee used their old statues as rubbish to fill up holes, the Medievals used carved Norman stonework as raw material, and carved on its back, and the Saracens did the same with some of their carved woodwork. While such is our humility, that a large portion of the profession is engaged in restoring old buildings, or in building imitations of the past. The same may be said of some of the sculptors and painters, in regard to Gothic statues and stained glass.

If we wanted any confirmation of this, we have only to look at a modern architectural guide-book to an English town; we shall there find the different buildings described as Greek, Roman, Byzantine, Romanesque, Saracenic or Moorish, Norman, Early English, Geometrical, Perpendicular, Tudor, Elizabethan, or Renaissance. To get a popular opinion of the absence of any distinctive style of the day, you have only to tell anyone that no past style should be used, and he will ask, with well-marked surprise, what can be done, if it be not Classic, Gothic, or Renaissance?

This, perhaps, is not the worst phase, for not only is the architect looked on by the public as a supplier of old fancy dresses for buildings; but too many architects are of the same opinion. The architect, in too many cases, is believed by the public to be like a comic actor whose business it is to parody all the expressions of former national character, from Greek to Chinese, and not to give expression to our own.

Archæology is a charming science, of great interest to every one, and of the very highest importance to the historian; but it is not only not architecture, but, when it is used as a sub-

stitute, it is fatal to it. Progress is the watchword of architecture, but with the archaeologist it is the unparadonable sin. The architect's business is to improve on the past, the archaeologist's to reproduce it, no matter how bad or ugly it be. The architect's canon is, that every part of a building is to be good in itself, and help to produce the proper effect. The archaeologist's canon is to have precedent—i.e., that the modern building has been taken direct from one built ages ago; the architect of those days may have been ignorant, may have bungled, may have spoiled his building, but the archaeologist is satisfied, perhaps delighted, if you can exactly reproduce these bungles.

It is surely worth the deepest thought, earnest and vigorous striving, and strict self-denial to get architecture again on the line of progress, if it be possible. I by no means say that it is possible, for the wheel of fortune turns, and Science, that in Mediæval days was in the mire, is now at the top of the wheel, while Art is in the mud. We have, however, this advantage over the Mediævals, that, whether we be successful or not, we shall not be burned alive for trying, though we may starve. Even when to be suspected of dabbling in Science meant the chance of the dungeon, the rack, and the stake, the votary of Science would study it. We have, too, some encouragement for trying, for Greek art and Greek science flourished together.

Democritus, the founder of the Atomic theory, lived in the days of Alexander the Great, when the Temple of Diana of the Ephesians was rebuilt by Dinocrates. As far as I know, there is no *a priori* reason why Art and Science should not flourish together, although in latter times we know they have not. We should now think it absurd for eloquent writers on Science to advocate the worship of the rushlight, when we have the Argand lamp, gas, and the electric light; but in Art we are in that unhappy position, that some of the highest eloquence of the day is devoted to the worship of the rushlight, and to the prophecy that it can never be surpassed. The eloquence we want must dwell on the inestimable benefits architecture confers, and should point to the invention of the electric light as an instance of what well-directed effort has attained. A fixed idea that no advancement can be made is fatal to all progress. So long as Ptolemy's theory was accepted as the ultimate truth, no progress was, or could be made in astronomy; but when Copernicus, Kepler, and Galileo investigated the matter, they proved that the earth was a spheroid that revolved on its own axis and round the sun; and since their day, not to speak of Newton's discovery of the law of gravitation, the knowledge of astronomy has been constantly increasing.

All the architectures that we now call "styles" could never have come into being if each nation had determined that Greek architecture was perfection, and no improvements in arrangement, construction, or æsthetics could be made. With considerable gaps there was a regular advance, at least in construction and arrangement, from Greek to Mediæval times; it was left to the Italian artists of the Renaissance to start a belief that Roman architecture was perfect, and that all mankind could do was to try and restore it, with the effect that architecture has hardly moved from that day to this. Many observers have been sagacious enough to see that architecture is practically stationary, though the fashions have been constantly changing; but it was only quite lately that the reason, or one of the reasons, for this has been discovered—that is, that the method was wrong. The Gothic revivalists were eloquent enough, and brought the fiercest invective to bear on the Roman and Greek models, but while they advocated the change of model, they were quite contented with the method.

The question is, how are we to get the genius, capacity, skill, knowledge, and taste—if there be any taste—of the present day mirrored in our architecture? It is true we have the sculptors and painters to help us, but they can give us nothing of the present, but animal and vegetable life; for the clothing of the day, and the attitudes and groupings of the people, are neither sculptural nor picturesque.

As regards architecture itself, we must, I think, make up our minds what we want; and these wants are twofold: material and intellectual. Let us take the material wants first. Do we want a high-pitched roof for snow to slide off, or a moderately pitched roof for rain to run off, or a flat roof? If we have a flat roof we cannot reasonably have a gable, and perhaps not a cornice. It is difficult to say whether a dome

is to be looked on as a material, or an æsthetic, want; in a hot climate a dome not only gives increased air space but looks as if it did, and may be useful to let in light high up, though a lantern will generally answer both purposes. It has been stated that this Byzantine feature was adopted by the Saracens, as reminding them of their umbrella-shaped tents, which, if true, is an æsthetic reason; but as to whether the dome is wanted to be best seen from the inside or from the out, is certainly an æsthetic question. If it be wanted to compose with the inside, it forms no striking external feature, while if it is to be an external feature it will not compose with the inside; you merely see a gap, until you are under it and look up.

Everything that is palpably unreasonable in a building is a blot. We can to some extent, by care and knowledge, arrange that we have nothing wrong in constructive shape, in area, or in arrangement; but all this, I fear, will not produce a building that raises high emotions; but, on the other hand, we know what emotions the use of most buildings ought to evoke, and that is something. It is obvious that if we were to follow a strictly reasonable method, without any thought but for utility, we should probably produce buildings that were very different from the existing masterpieces of architecture. Nature, in making everything purely for use, makes most things shapely, and occasionally makes them beautiful, but we by no means have Nature's gifts in this respect. If we use, as we must eventually use, iron and steel for those parts which are to bear great weights, great strains, or to bridge wide spans, and make the ironwork visible, we should not only find that these materials would take new shapes, but must give rise to new ordinances. Iron pycnostyle, systyle, eustyle, and areostyle would be very different to those of marble columns with marble architraves. Shapeliness in iron must be reached by new proportions, and its enrichments must be different from those in marble on account of the exigencies of the material. Horizontal girders being the most convenient form that iron will take, vaulted ceilings will be superseded by flat ones, and flat roofs will be substituted for high-pitched ones.

All the large iron buildings yet put up, have been merely for temporary or commonplace purposes, and have mostly been rapidly and cheaply done, to meet some sudden requirement. They have not been called for by the nation for the purposes of magnificence or for the highest ends to which buildings can be devoted; and so have scarcely entered the pale of æsthetic building. Sheds for the mere protection from the weather of people, animals, trees, or goods, are not wanted or expected to raise any high emotion, but if, as we all hope, the whole bulk of the people improve as much in intelligence, morality, and cultivation as they have materially, we may look forward to vast structures, not only "built for pleasure and for State," but dedicated to still higher purposes. When we have so wonderful a material as iron to our hand, the mind almost shrinks from contemplating the possible sublimity of buildings designed for the nation by the highest talent, and for the purpose of exciting the highest emotions. We picture to ourselves their colossal size, their novelty, and beauty of shape, their perfection of composition, and the exquisiteness of their detail, glowing, too, with the colours of enamel, while each building is gloriously adorned with sculpture and painting. Even now, the inside of the Crystal Palace is one of the most striking buildings in the world, although there was no attempt at building anything beyond a vast greenhouse.

I have the greatest possible confidence in the rising architects of the day, if they be not led astray by false teaching, or demoralised by the desire of becoming rich. They have seen, by travel, many of the past triumphs of our art, and, by photographs, almost all the existing architecture in the world. They have in one respect distinguished themselves above the students of all other professions by their thirst after knowledge; for they have not only taxed themselves to get it, but organised the only complete Architectural School in the kingdom. As far as they know how, they have used every exertion to acquire that deep and varied knowledge that is wanted for the most exacting profession that exists.

I doubt if the world has ever seen a failure, when all have been striving to do their utmost, and it is at such times that genius mostly makes its appearance. Themistocles emerged between the first and second attempt of the Persians to conquer Greece, and Publius Cornelius Scipio in the high tide of Hannibal's conquests.

If it be allowed to compare the present con-



dition of architecture, of architectural aspirations, and of architectural instruction with another time and a different desire, it may be said that Italy in the thirteenth century was precisely in the position that English architecture is now, for then, throughout the length and breadth of Italy, each poet studied all the poetry he could find, and strove to create a language in which he could enshrine the stirring thoughts and actions of his time; and eventually Dante appeared. It was at the end of such a time, among a galaxy of poets and playwrights, that Shakespeare was born. If our nation continues to cultivate the virtues of wisdom, courage, temperance, and justice, whose practice has carried it so far, we may hope that it will shortly want splendid buildings for the noblest ends; and if the architects and students are still as eager, energetic, and persevering as they now are, that the great architectural genius will shortly arise who is destined to carry architecture on its new path; that by that time the nation will have seen the supreme importance of architecture to mirror its greatness, its virtue, and its culture, so that he may be able to create buildings worthy of his genius, and to found a school that will give to the world a succession of buildings of a vastness, an impressiveness, and an exquisiteness, that will cast into shade and insignificance all the architectural triumphs of the past. G. AITCHISON.

#### THE ROYAL INSTITUTE OF BRITISH ARCHITECTS.

THE seventh ordinary general meeting of this Institute was held on Monday last at No. 9, Conduit-street, Mr. J. Macvicar Anderson, President, in the chair.

The minutes of the previous meeting having been taken as read,

Professor Kerr read a paper entitled:—

#### Observations on the Plan of Dwelling-houses in Towns.

After touching on the radical importance of good planning—for of what avail would be the strength of Hercules, the symmetry of Adonis, the splendour of Apollo, with a rickety organisation within?—Professor Kerr referred to the English dwelling-house as professing to be, in respect of plan, the best in the world, home comfort being its special characteristic. The organic arrangement of a dwelling-house began and ended with the idea of home or family comfort. The great difference between the house in the country and the house in the town was that in the one case the accommodation was conveniently spread out over the proper extent of ground-space, while in the other it was so squeezed together laterally that it flew up into the air. Height became the substitute for breadth, and rooms which would naturally be disposed side by side had to be artificially piled up tier upon tier. This crowding was what constituted the town, and, as we knew that all forms of crowding of animal life produced pollution of the air, it followed that a town became so far an unwholesome place of habitation. He remembered a suggestion once offered in public by an eminent physician—namely, that one of the principal causes of the disappearance of the great cities of antiquity might have been that the inhabitants were driven away by the intolerable pollution of the soil.\* Crowding must, in the very nature of things, bring with it the evils of crowding.

In the organisation of a plan it was not enough to account for a certain list of rooms, and to provide them all of such dimensions respectively and with such relations to each other as should be to the whole not unacceptable; this was little better than the old-fashioned mode of the Vitruvian Britannicus, by which the house was endowed with an academical exterior and a symmetrical interior, and the occupants were left to settle down in it as they best could. The skilful architect nowadays would include in his plan the furnishing of every room; in imagination he would personally occupy every corner, pass inwards and outwards through every doorway, and consider the precise exterior effect and lighting-value of every window. The symmetry and stateliness of an academical plan—on paper—were always attractive; but, in modern English dwelling-house plan of a high class, considering the extreme complexity of the accommodation, this paper simplicity was falla-

\* It seems certainly possible that this may be the end of London. And there can be little doubt that the unhealthiness of Rome and its neighbourhood is to some extent caused by the saturation of the soil with decayed and polluted matter from ancient Rome, though that was not the immediate cause of "the decline and fall of Rome."—En.

cious. The only efficient test was to follow out the full detail of actual family occupation.

As to the plan of a town, it was of no use to direct attention in England to the question what the plan of a town ought to be. Every one of our towns had initiated its own plan by chance, and developed it in its own way on the same principle. The leading lines were the accidental roadways of ancient traffic, and the enlargement of the place had been governed, from time to time, by the demands of business. The story of Regent-street was an interesting illustration of the achievement of a great public improvement, and what had come out of it. The houses were designed in a manner which was deemed adequate for their stately situation. But now, when only three-quarters of a century had passed over them, how had they come to be regarded? Two half-miles of very shabby little shops, below the mark of many a new third-rate street, marvellously made the best of, but cumbering the ground; scarcely worth their ground-rents but for the exigencies of the locality, the showy shop-fronts, and the spacious dignity of the roadway; the wonder being that they survived at all! In about five-and-twenty years the Regent-street leases would fall in *en masse*—and what was to be done then? The problem which the Crown agents would have to face was not merely how to appraise high ground-rents, but how to rebuild at all without disorganising a considerable proportion of the trade of London! He would respectfully suggest the possibility of beginning to rebuild forthwith, by simply announcing a readiness to entertain whatever private proposals might be offered piecemeal, upon certain general terms that could easily be formulated; and then, he believed, there would be a brand-new Regent-street to show long before the twenty-five years were out, not only as a great benefit to the public and the town, but equally to the advantage of the Crown estate.

In the classification of town houses, the first or leading class of dwelling-houses in any large town was obviously the street house, one of a close row where mere standing room was economised to the utmost. Although it was impossible for him to go into details of plan, there were two points in respect of our ordinary street houses upon which he might say a word. He was entitled to assume, for instance, that every architect instinctively shaped his rooms aright, and disposed their doors, windows, and fireplaces in proper relation to each other; but why must he scamp the entrance-hall, degrading one of the most important items of residential convenience and pleasantness to the level of a rabbit-hole? And why, again, attach the title of "bedroom" to haphazard chambers without ever thinking where even the bedstead is to stand? The first step in designing a street house of any importance, was to prepare a list of the required rooms, with their approximate dimensions, and to proceed to classify them by area of floor-space, so as to be equally divided between the requisite number of stories. Take the case of a good house, in a fashionable quarter of London, worth about £7,000, five stories in height, and occupying about 2,000 square feet of ground within the walls. The scheme of arrangement might then stand thus: On the basement floor, kitchen and scullery, larder and store-room, butler's pantry and bedroom, housekeeper's room and servants' hall, wine and beer cellars, knife-house, closets, &c., corridor and back stair, with front area and vaults for coal and dust. On the ground floor, dining-room and servery with lift, library, gentleman's room and billiard-room, porch and entrance-hall, cloak-room, and lavatory, principal staircase and back-stair. On the first floor, drawing-room and morning-room, principal staircase and gallery-landing, conservatory, a bedroom suite and bathroom, and back-stair and service with lift. On the second floor, principal staircase, bedrooms and dressing-rooms, nursery suite and school-room, bath, &c., linen-room, and housemaids' closet, with lift and back-stair. On the third floor, bedrooms, back-stair with lift, servants' rooms, bath, &c., and housemaids' closet, and a lumber and box-room. He would have the entrance-hall wide, well lighted, and warmed; and the billiard-room top-lighted, if only by means of a projecting end with a glass roof. A special corner of the plan ought, of course, to take practically all the water-served accommodation. The nurseries would be adapted for use as bedrooms. The back-stair must be sufficiently lighted; and he saw no objection to an internal area for light and ventilation otherwise. He did not object to the good old principle of having the entrance door in the middle, with rooms right and left. Moreover, he would insist upon the back wall of the house being as well designed as the

front; and the rear ground, however small, ought to be pleasantly laid out for actual enjoyment.

The suburban house, properly so called, was in principle a country house. In good examples it ought to have no basement offices; and even a second story of bedrooms ought to be limited in extent, or, if possible, avoided altogether, except, perhaps, for servants' rooms; that was to say, the house ought to cover ground as liberally as circumstances would allow; for it had escaped from the crowd of the town, and could take no excuse for being stinted of anything in reason that belonged to open space.

Convenience was the foremost question of residential organisation; the elementary arrangement of the vital apparatus or mechanism of the dwelling, by means of which it *would go*, while the equally substantial and perhaps more handsome house next door, having been planned anyhow, *would not go*.

The English idea of domestic comfort depended very much upon privacy, especially as to the complete separation of the family from the servants, a rule which applied to every house, however small, that came under the category of a "gentleman's house" in England. He had seen it argued that this was obsolete conservatism, or aristocratic pride; but we had professionally to plan a house for the prosaic facts of housekeeping; the family as one class demanded and were entitled to their own privacy, and the servants as another class demanded and were entitled to theirs.

As to aspect and prospect, it was useless to suggest that the element of aspect, all-important as it was in the open country, should be materially considered in the streets of a town.

But in a suburban house both aspect and the diffusion of light and air must be fully considered. One or two points in planning might be mentioned: We ought never on any account to have a dark staircase. Let us always make our hall as spacious as possible, and as bright and airy. Again, we must never light a room by the very common means of a pair of windows with a broad pier between them. Thousands of handsome dining-rooms were spoilt in this way; the shadow of the pier eclipsed the whole room; and when the artifice was resorted to of disguising it with a mirror, this almost added insult to injury.

The semi-detached house was a hybrid between the more crowded street house and the more open suburban; and as such it constituted nowadays a favourite class of ordinary, and sometimes expensive residence for the extension of our towns. But he failed to see any real advantage that it possessed, except when on a small scale, over the wholly detached house. The saving in ground-rent was open to question; and as for the party-wall, of all our structural contrivances, the domestic party-wall was one of the least felicitous.

In regard to homes for the working-classes, there were to be seen in and about London several distinct types of commonplace working-people's dwellings which were easily identified as the simple outcome of their habits. First came the independent cottage or very small street house, containing a living room and a small kitchen on the ground floor, and two corresponding bedrooms above, with a little yard or garden behind. Secondly, an occasional range of houses with an open gallery running along the front at each floor level, for access to so many tiers of lodgings, smaller but still independent. Thirdly, the "model lodging-house" so called, or block-building, divided internally into small suites, accessible from dismal public staircases. Fourthly, the inferior, but most common and perhaps most popular form of lodgings, in which an ordinary street house, with the usual two rooms on a floor, accommodated a separate household on each story, with perhaps more quietude if less privacy. Lastly, there was the same kind of house, or any other kind miscellaneously, which was let out in a rough-and-tumble way to the poor, and most generally in single rooms. The first of these orders of dwellings, the independent cottage of two floors, seemed to him the most desirable of all. Of course, it was really a country type; but in the suburbs, even of London itself, he saw no reason why it should not be the general rule. The second model, with the galleries, was to be commended for such quarters of the town as were more crowded, especially if private little balcony yards could be added behind. The large block buildings he disliked, and thought the inmates must dislike them. With reference to the dwellings of the inferior poor, many years ago he read a paper there which advocated the systematic supply of homes for the poor in the humble form of spacious single rooms, specially planned and provided with appropriate appliances, simply to take the place of the insufficiently large and



decidedly haphazard single rooms which they now occupied. He still thought this was one solution of the problem.

The system of residential flats seemed to have now effected a settlement in London; and, commercially speaking, the speculating builder, and none the less perhaps the speculating dealer in building land were no doubt making a good use of the element of ground-rent; but socially also there were certain attractions offered fairly enough to residents of several classes. However, it was easy to see that the popularity of such peculiar establishments must come in time to turn very much on questions of salubrity, and in this respect medical men were beginning to complain of them. The paper concluded with some general remarks on designing an English house, which were more or less a recapitulation of precepts laid down many years ago by the author in his book on "The Gentleman's House." In regard to the question of the picturesque, Professor Kerr remarked that the bric-à-brac Renaissance of the present moment would be found to be quite evanescent, in fact only a stepping-stone from the discarded picturesque of the Secular Gothic of five-and-twenty years ago towards some much more appropriate Renaissance of five-and-twenty years to come. The best compliment that could be paid to the miss-called Queen Anne style, or Flemish Rococo, was that it was clearly a Teutonic, and not a Latin, mode, and therefore on our own side of the racial dividing-line; but how far this was sufficient to confer upon it a historical value of its own was another question. There were only two foreign models to which he would allude—the French and the American. France exhibited in perfection the type of plan which in England we had left behind us; while America illustrated what seemed to be before us. A private residence of the best class in Paris was a highly-refined example of advanced Italian or Neo-Grec Renaissance, academically designed, both without and within, for artistic grace, but organised more for stately and often grandiose effect than for what we considered to be family comfort. On the other hand, if we turned to the United States of America, what we saw in domestic architecture was of special interest. There was great activity, a good deal of miscellaneous ambition, considerable promise in respect of artistic character, and—this being the point that concerned us at the moment—a certain amount of that kind of utilitarian enterprise which conducted to progress in interior organisation. It could not be said that the English mansion was being improved upon as regards its plan, or, indeed, that it was yet emulated; but the practical and empirical inventiveness of the American intelligence seemed to be likely to engage itself in the suggestion of novel appliances in such matters as drainage, heating and cooking without gross waste of fuel, contrivances for ordinary ventilation, the smoke nuisance, the use of gas, electric lighting, the water supply and service, the freezing of pipes, fireproof construction, the use of lifts, and so on, and we must confess that if the Americans, as they were always saying, accomplished results while we were thinking over preliminaries, we should be only too glad to have the benefit of such promptitude if they would seriously turn their attention to the wide field of domestic contrivance.

A communication was then read by the Secretary, Mr. White, from Mr. Arthur Cates, in reference to Professor Kerr's suggestion that the rebuilding of Regent-street might be facilitated by the Crown authorities simply announcing their readiness to entertain whatever private proposals might be offered piece-meal upon certain general terms which could easily be formulated. A course of procedure such as that so suggested would be only in accordance with the practice which had been generally adopted on the Crown's London Estate for the past twenty-five years, under which proposals for the surrender of existing leases, which might have comparatively short terms to run, and the grant of new building leases to facilitate the consolidation of holdings, and the substitution of one good building for several of inferior type had been favourably considered, and under such arrangements many of the important buildings of late years erected on the Crown Estate had been rendered possible, all subsidiary interests in the smaller buildings removed having been extinguished. The Queen's Concert Hall in Langham-place was one of the most recent instances of the advantage gained by the surrender of outstanding leases, and the grant of a new building lease for the consolidated site. As regarded Regent-street, on December 17, 1877, in opening

the discussion on the paper on "Middle Class Houses in Paris and Central London" by Mr. William H. White, now Secretary of the Institute of Architects, he dealt with the subject of Regent-street, and the great benefits conferred on the metropolis by the magnificent improvements carried out by the Crown in forming that street, Pall Mall East, King William-street, West Strand, &c., and especially commented on Mr. White's suggestion that a particular block of property in Regent-street—an "island" as he termed it—the reconstruction of which he advocated in accordance with his views of the arrangement proper for business and residential houses in Central London, being—"Crown or national property is above the law; so, for more years than I can live, it must remain beyond all possibility or hope of improvement in the direction to which the make-shift alterations of the actual tenant unmistakably point." The responsible managers of the Crown Estate had but one anxiety—to promote the welfare of the property and of its occupants, and were at all times ready to meet those who might be in a position to effect these improvements. He further said that if Mr. White had a client prepared to surrender all interests in the island he referred to, the Crown would be happy to afford all possible facilities for the removal of the houses now standing, and the granting of a fresh term of lease for the erection of his combined dwellings. However willing and desirous the Commissioners of Her Majesty's Woods might be (with due regard, of course, to the interests of the Crown) to encourage and carry out such arrangements more extensively than had yet been possible, there were great difficulties to be overcome especially in regard to the Regent-street houses, where, besides the valuable trade interests involved, the real obstacle to the desired improvement was the web of legal restrictions in which most of the properties were entangled by settlements and the like devices, which tended to keep the improvable unimproved, and check in every direction all efforts for development—obstacles which appeared to be almost insuperable, except with the aid of empowering legislation specially aimed at them. There were other considerations which must greatly influence dealing with Regent-street. Any rebuilding such as advocated by Professor Kerr could not be of single houses, forming a mere narrow strip of elevation, perhaps well enough adapted to form a bold advertisement of the business of some individual tradesmen, but to secure the necessary architectural effect must be in blocks, and where such block was not an island or of isolated design, due regard also must be had to the surroundings of the property to be dealt with, and any such dealing with The Quadrant would clearly be inexpedient, but wherever it might be practicable to rebuild without erecting a deformity the proposal of those persons who, in the opinion of Professor Kerr, were not only ready but anxious to find the money to rebuild Regent-street entirely would certainly receive the most careful consideration of the Commissioners. How far the extreme restrictions on building and rebuilding in London, contemplated by the London Streets and Buildings Consolidation and Amendment Bill, now being promoted as a private Bill by the London County Council, would affect the monumental rebuilding not only in Regent-street, but throughout the metropolis, was a subject which should receive earnest consideration from the Institute as a matter of grave importance likely to seriously affect the interests of architectural and of business development.

Mr. Lacy Ridge, after expressing his appreciation of the paper, referred to the London Streets and Buildings Bill, and stated that the Practice Committee and their sub-committee had had the matter under their consideration for a very long time, not only since the Bill of the London County Council was brought out, but for years before, the Practice Committee having drawn up a Bill of their own, on which, in part, the Bill to be brought before Parliament was founded. The present Bill did embody a good many of the suggestions which emanated from the Practice Committee, and that, he thought, should make the Institute look very favourably upon the action of the County Council in having brought forward a Bill for the amendment of the numerous acts which now affected building in London. At the same time neither that consideration nor any other could possibly blind them to the extreme danger to the property of the individual in many of the enactments which it was proposed to embody in the Bill. What action it would be necessary for the Institute to take on the matter hereafter was now under consideration.

In conclusion he proposed a vote of thanks to Professor Kerr for his paper.

Mr. John Slater, in seconding the motion, said the difficulties of buildings in towns were only appreciated by those who had to do with the planning of such buildings. One of the greatest difficulties which he experienced was to arrange for the continuance of houses which were quite inadequate to the requirements of the town, for the sake of carrying out a larger improvement when the leases of other houses immediately next to them were falling in two or three years' time. He had come to the very decided conclusion that it was undesirable to take two or three small houses in such streets as Berners-street and Newman-street, and rebuild those, when the leases of other houses adjoining fell in shortly. One of the greatest difficulties they could experience was the dealing with the corner sites. In a great many cases corner houses were small and inadequately provided with light and air at the rear. If they could possibly manage to get two or three more houses on either side, and carry out a large, comprehensive scheme, they would do better than by attempting to rebuild any corner house by itself. The question of workmen's dwellings had received a certain amount of attention from himself, for he happened to have erected two large blocks of such buildings not far from the Marylebone-road. Undoubtedly they could, by careful planning, erect buildings which could be substantially built, well arranged with good sanitary accommodation, and with a fair amount of light to all the rooms, in order to pay a very good interest for the money. He alluded to those buildings for the better class of working men. But undoubtedly the great difficulty was, what to do with the extremely poor people. That was a problem which he did not think had been sufficiently considered, and he was quite sure it had not been solved. He thoroughly concurred in what was stated in the communication of Mr. Cates as to the great difficulty in dealing with any such property in London, caused by the entanglement of settlements and various other things. On the Berners-estate they were only too pleased and anxious to grant new building leases if people would surrender their present interests; but sometimes these interests turned out to be three, four, five, six, and even seven deep, and it was almost impossible to buy them out. With regard to the shopkeepers' houses, Professor Kerr had mentioned how completely the conditions of living had altered. This was most strikingly shown in many of the houses on the north side of Oxford-street, which were planned and built as shops and residences. Only ten days ago he had to go over one of those houses. The whole of the area had been covered with pavement, the staircase had been taken down, the access to the upper rooms was through the shop, and the dining-room for the assistants had not one single particle of daylight coming into it. That was a state of things which they found in too many cases in Oxford-street, and there could not be the slightest possible doubt that the sooner those conditions were terminated the better for the people who had to live in these houses.

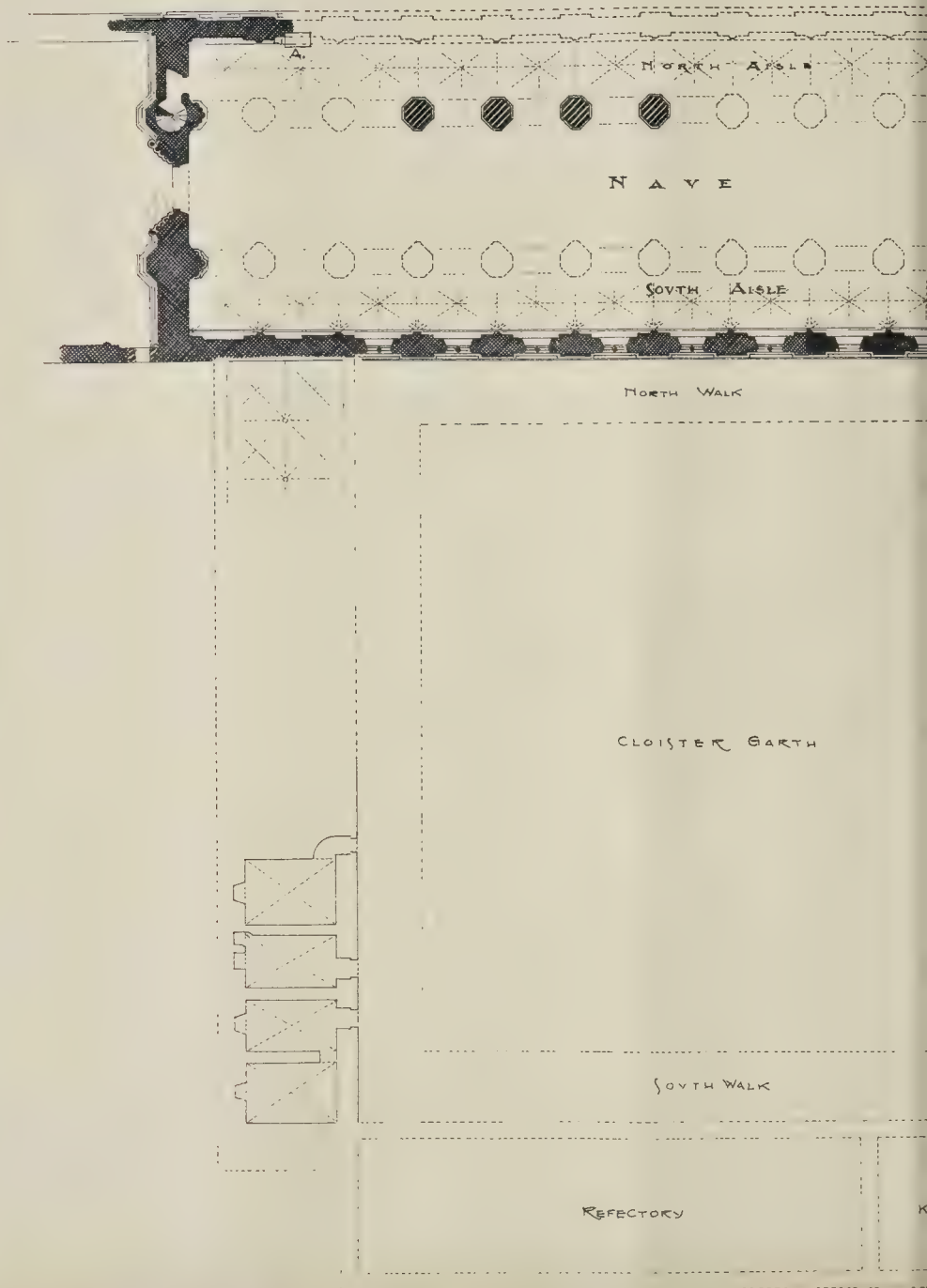
Mr. J. J. Stevenson said the difficulty in the planning of the town house was this, that they got a block of, perhaps, 60 ft. deep and 21 ft. wide, with no light except at the two ends. How they were to light up that block in the centre was the one great problem of house-planning. He observed that the plans exhibited had mostly avoided that difficulty, their authors no doubt sending their more important buildings with more light all round. That plan of a London house had a regular historical development from the time of King Stephen, when that proviso of the London Building Act which insisted on all party-walls was first introduced. There was one thing which he thought was wanted to make the London house, with its seven stories, really fit to live in, and that was a passenger lift. House-agents objected on account of the cost, and lest people should think them dangerous, but they worked with perfect safety and success in many houses, and their cost was balanced by saving a servant.

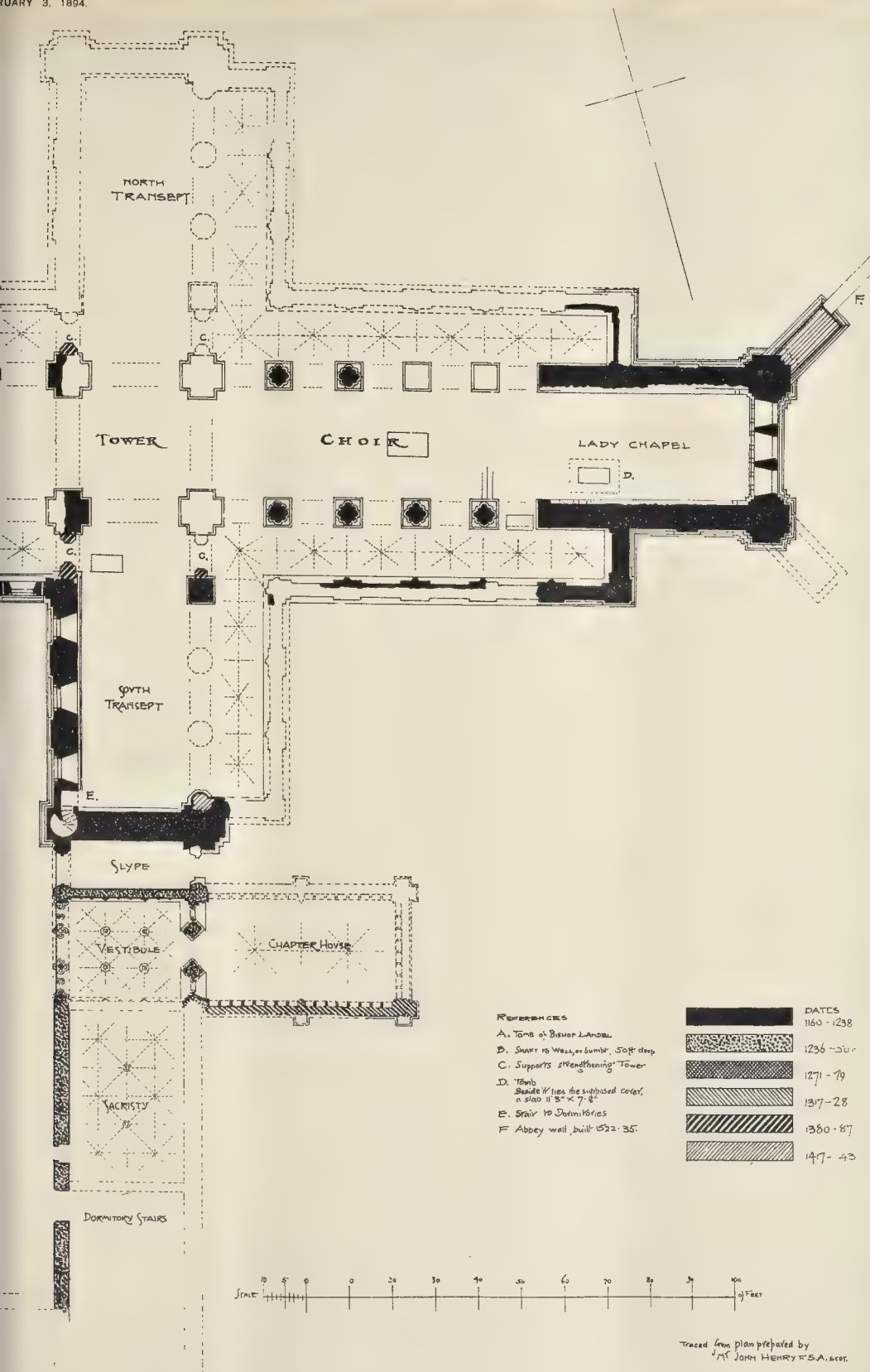
Mr. Astor Webb thought all the members would admit that Regent-street was one of the finest and most successful streets that London had ever had in the way of the grand lines on which it was laid out. Seventy-five years hence they could hardly expect that Shaftesbury-avenue or some more modern streets would hold their own as well as Regent-street did to-day. Professor Kerr had spoken of the academical plan. Of course, the academical plan did not enter so much into private houses as into public buildings. He took it that what was wanted even in the





# ST ANDREWS CATHEDRAL









town house was some little mystery in the plan. A good deal of improvement might be made in the arrangement of the windows; very often the windows were made too low down, and it was a common thing to see the lower part filled with screens. Probably a very picturesque effect could be got by keeping the sill of the windows a great deal higher, and running the window nearly the whole width of the room, and so getting the light in a horizontal line instead of in two or three vertical ones. There was a charming example of something of that sort in one of Mr. Norman Shaw's houses at Queen's Gate, plans of which were exhibited that evening.

The President said the very wide nature of the subject Professor Kerr had treated rendered it difficult to concentrate remarks, even if one were disposed to criticise where there was so little room for criticism. He had impressed upon them the extreme importance of avoiding overcrowding in all planning, and in securing a sufficient supply of fresh air. The importance of this could not be overestimated in regard to a new departure in planning in London, namely, that of flats. Professor Kerr had directed their attention to the fact that doctors had recently impressed upon the occupants of flats the danger they incurred from the want of fresh air, and possibly the insalubrity of being closely packed, but this remark, it appeared to him, applied equally well to the vertical system of planning as opposed to the horizontal. If a flat was properly planned, with a sufficient supply of light and fresh air, there was no reason in his judgment why it should be more insalubrious than a building constructed on the vertical system. This question of the proper supply of fresh air to the City of London might be taken as the keynote of the proposed Consolidation Amendment Building Act. The Institute had for years advocated the passing of such an Act, and therefore they had every reason to wish the London County Council well in carrying out a good and efficient Act of this description. Some of the principles of the Bill were such that, unless modified, they could not concur in. Although the motive was admirable, the securing of a sufficient amount of fresh air and light, yet the means by which that was to be effected in a city like London appeared to him to be perfectly chimerical.

The vote of thanks to Professor Kerr was then passed with acclamation.

Professor Kerr, in reply, said the request for plans to be exhibited on that occasion had been so singularly successful that he thought the Institute might contrive to have similar exhibitions on future occasions.

The President announced that the next meeting of the Institute would be held on Feb. 12, when papers on "Mosaics and Fresco" would be read by Mr. C. Harrison Townsend, Mr. J. C. Powell, Mr. G. Salvati, and Mr. N. H. J. Westlake.

#### ENGINEERING SOCIETIES.

**JUNIOR ENGINEERING SOCIETY.**—The ninth anniversary dinner of this Society took place on the 27th ult. at the Holborn Restaurant. Mr. J. Wolfe Barry, the President, was prevented by illness from being present, and the chair was accordingly taken by Professor J. Perry. After the loyal and patriotic toasts, Sir P. Magnus, in proposing "The Senior Professional Institutions," said that, as far as his observation went, engineers were mostly conservative in feeling as well as in politics, and yet there was no profession under the sun which was so democratic as that of the engineer. It was the main object of the engineer to level things. His great works were shown in making crooked paths straight, in driving roads under mountains, and in preparing a way over the deepest chasms and the broadest rivers. Mr. Giles, President of the Institution of Civil Engineers, in responding, said that the world was more indebted to engineers for the advance of civilisation than to members of any other profession. He referred to the progress that had been made of recent years in telegraphic communication, in the speed of ocean steamships and railway trains, and expressed a doubt as to whether any man who had attained eminence in his profession had been content to confine his working day to eight hours.—Professor Perry also responded.—After the toast of "The President and Past Presidents," which was proposed by Mr. H. J. Young and acknowledged by the Chairman, Mr. A. R. Binnie, Chief Engineer to the London County Council, gave that of "The Junior Engineering Society," dwelling upon the importance of giving scope to the faculties of observation and imagination, as well as of taking the benefit of experience in the acquirement of



Window, Brechin Cathedral.

scientific knowledge.—Mr. S. H. Wells, a former Chairman of the Society, responded, and the toast of "The Visitors" brought the proceedings to a close.

#### Illustrations.

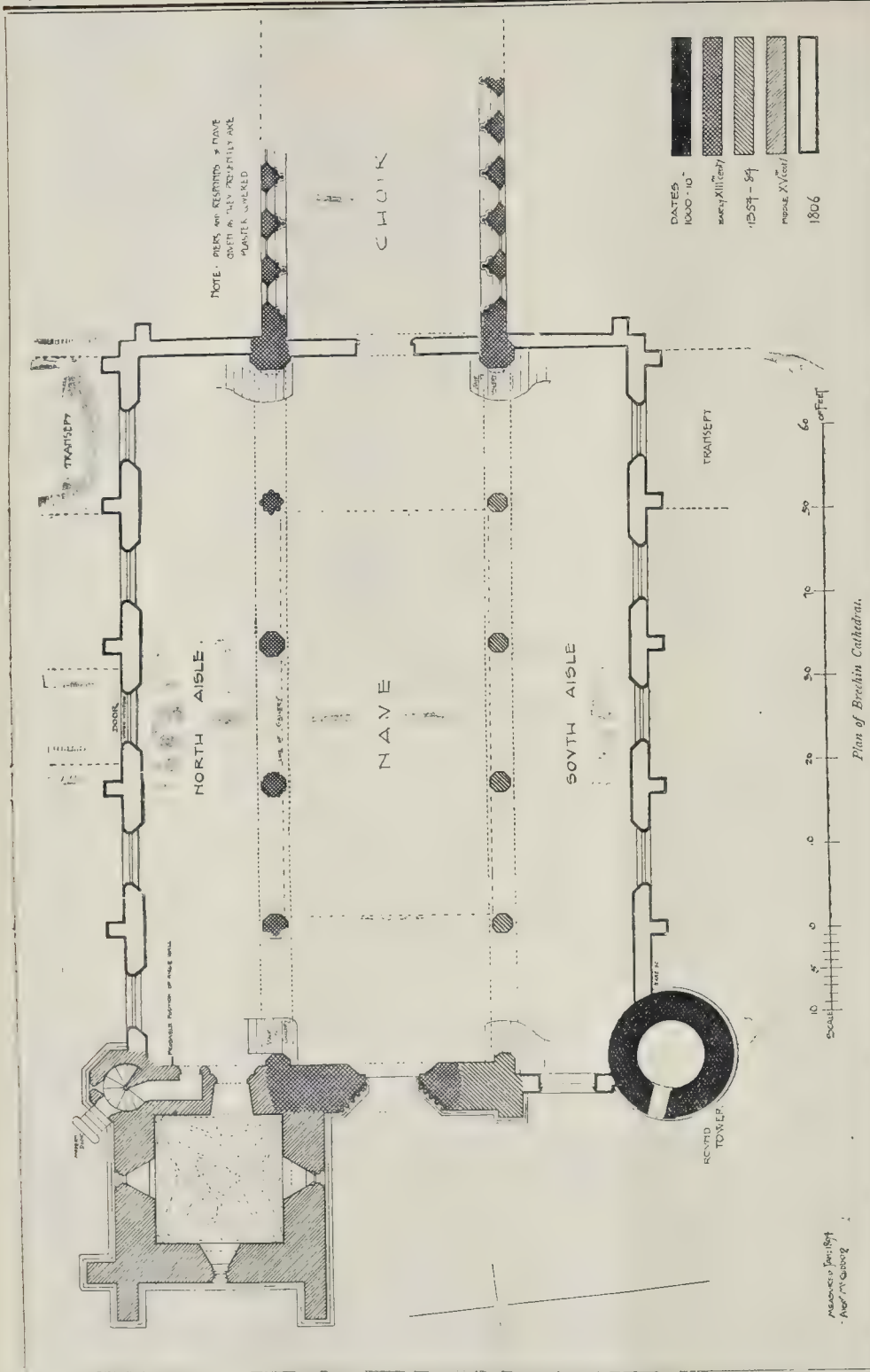
##### BRECHIN CATHEDRAL.

**T**HE most notable antiquity of Brechin is the Round Tower attached to, but no part of, the Cathedral, and whose date is supposed to be about 1000 or 1010. There is considerable difference of opinion, both as to its origin and its purpose; but the Christian symbols on its door prove it to have affinity with the religious sentiments of the community that from much earlier times was settled there. The only other round tower on the mainland of Scotland, it may be noted, is at Abernethy—also a seat of Pictish power; there is a third tower in Orkney; but the Brechin example is the largest—inferior, however, to many of the Irish round towers, that of Kildare out-topping it by 45 ft., being 132 ft. in height. Dr. Petrie is of opinion that Brechin tower is the work of Irish churchmen; its purpose has been variously surmised as a

mausoleum, place of security and bell tower, or the retreat of religious recluses; the last, perhaps, the least likely. Westwards of the tower lay a Culdee monastery, that remained constituted down till 1248, but no trace of its buildings remain. The beginning of the ecclesiastical system that superseded the Keledei, dates from the time of David I., 1124-53; and the middle of the twelfth century is generally given as the date of the earliest part of the present building, but this is at least half a century wide of the mark. The portion of the choir and the west doorway are the only portions of the first period exposed to view; the nave arches and piers are so covered up with plaster that it is matter of presumption rather than proof that connects them with these portions, whose date, to correspond with their Transitional character, cannot be earlier than the first quarter of the thirteenth century. As the nave south piers are slimmer, and the arcade above narrower than those of the north wall, it is suggested that they may be of later date—possibly the same as the south part of the west gable, that has certainly been rebuilt.

Unfortunately the bases of the piers of both north and south walls have been hewn off, so far

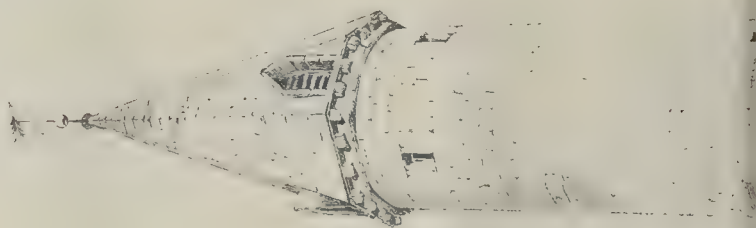








THE BUILDER FEBRUARY 3, 1894





THE ANCIENT CATHEDRALS OF SCOTLAND.—DRAWN BY MR. ALEXANDER MCGIBBON.

No. 9. BRECHIN











107 PHOTO SPRAGUE & CO. 485 EAST HARDING STREET FETTER LANE E.C.

THE ANCIENT CATHEDRALS OF SCOTLAND.—DRAWN BY MR. ALEXANDER MCGIBBON.

N. S. REMAINS OF ST. ANDREWS VIEW FROM NORTH WEST

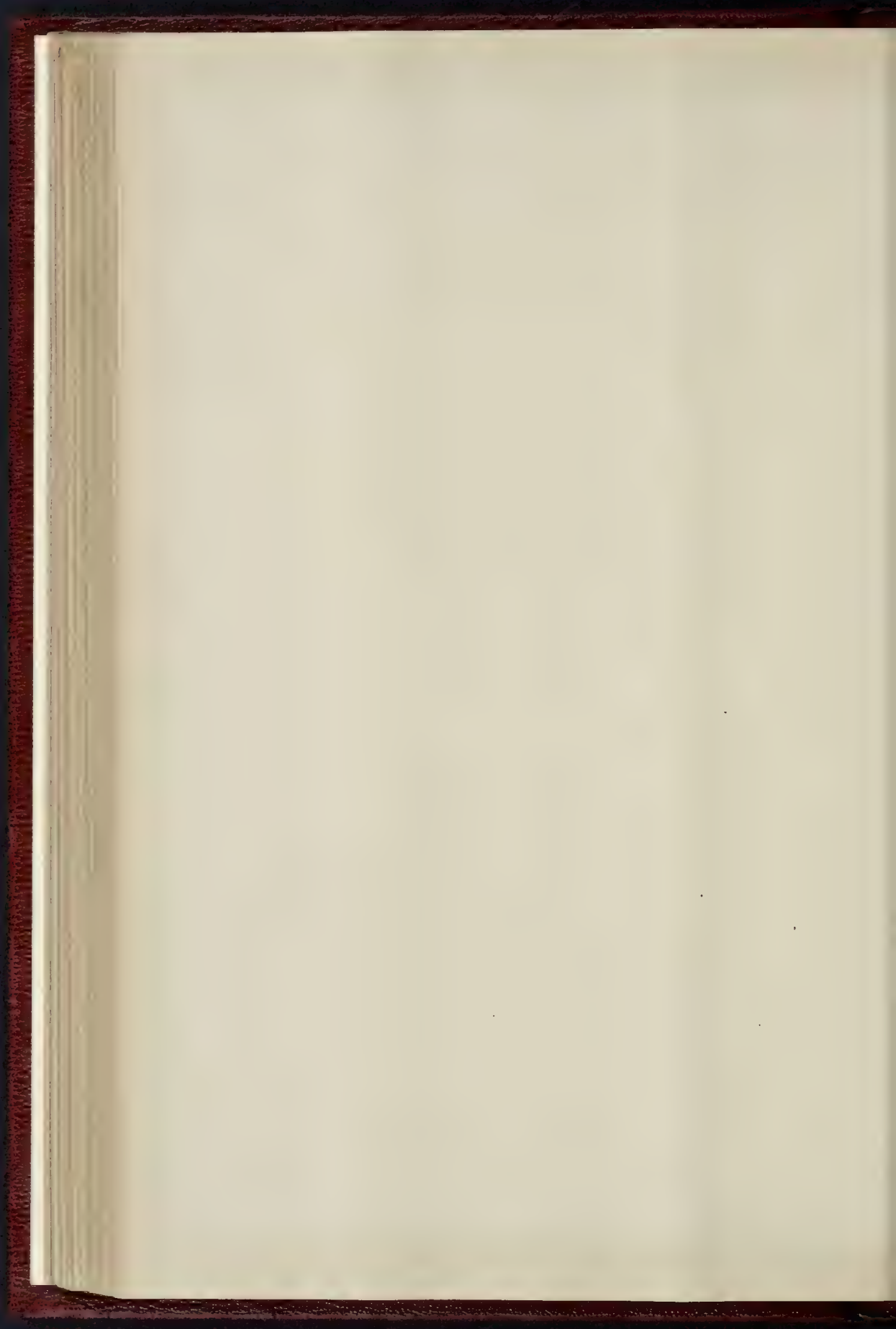


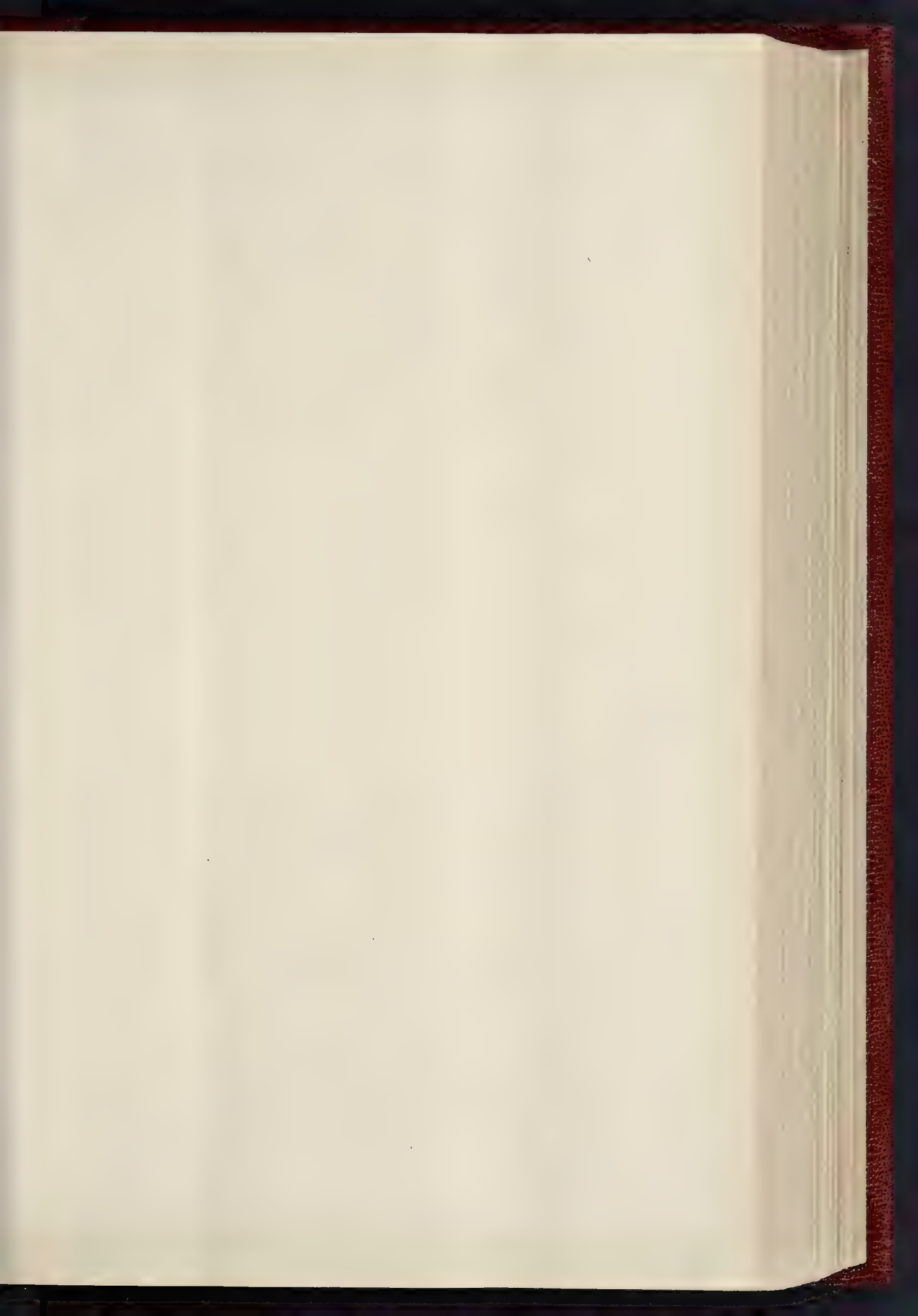
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THE ANCIENT CATHEDRALS OF SCOTLAND.—DRAWN BY MR. ALEXANDER MCGIBBON.

No. 8. REMAINS OF ST. ANDREW'S: VIEW FROM SOUTH-EAST.



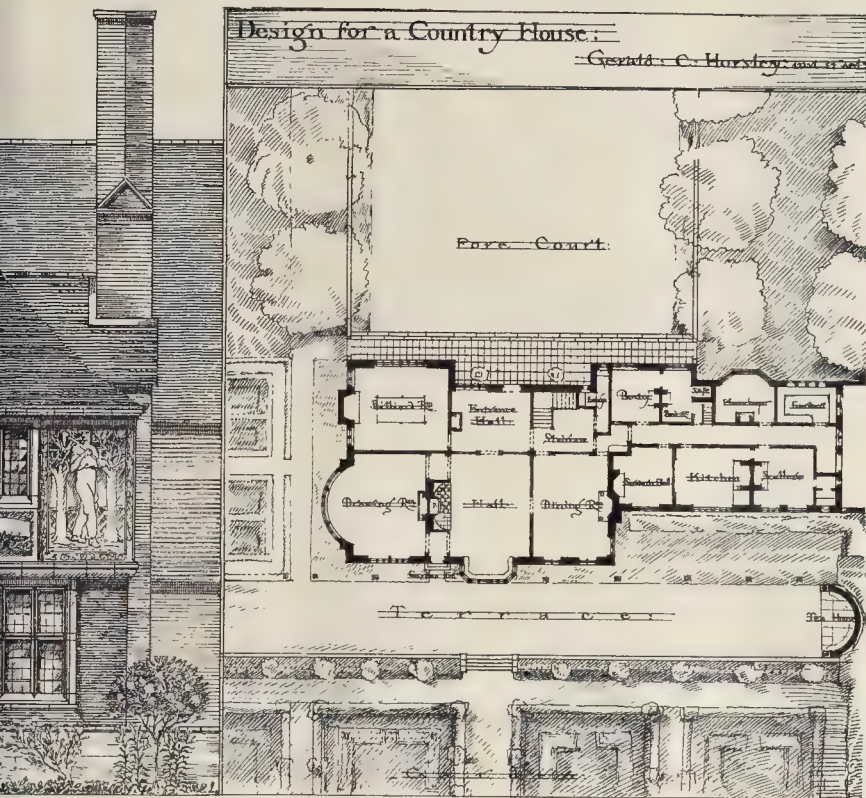






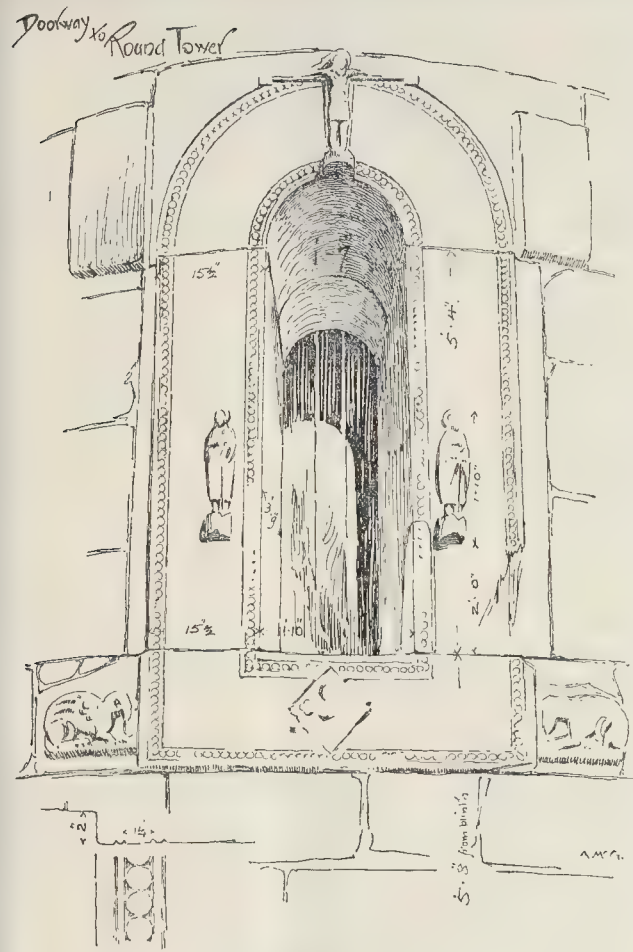












Door, Brechin Cathedral.

at least as the pews permit of so much of the bare masonry being seen.

Thus it would seem that this cathedral church, dedicated to the Holy Trinity, in its original state consisted of a choir without aisles, and of a length that cannot now be determined—though Walcott states it to have been 84 ft.—and a nave of five bays, with side aisles, of widths less than the present ones: the south appears to have quite cleared the round tower, and the north one to have been not more than 11 ft. wide; there may have been a north porch. It is unlikely that these aisles were vaulted; the choir and nave centre aisle could not have been. When, at the beginning of this century, the church was remodelled, north and south transepts were swept away. Their wall-heads do not appear to have been higher than those of the aisles; the position of their roofs is yet marked on the nave walls, the ridge just under the wall-head there, but from the fact that the pitch is marked by a coarsely-cut raggle or chase rather than a properly-formed weather course, and that one of the clearstory windows must have been blinded, we may conclude that these transepts were not part of the original plan, but may have been added when the south aisle was rebuilt or when the tower was erected. Some mishap has befallen the building, and so occasioned the rebuilding of the west gable, the doorway only escaping. In the new work built south of it a niche has been introduced, over the door the thickness of the gable is reduced, and in it is placed a window with flamboyant tracery. Later the bell tower and steeple were added; if we may judge by very

similar work at Dunkeld, not earlier than the middle of the fifteenth century. The ground floor chamber, most likely used as Chapter House, is vaulted; a subsidiary rib there is noticeable as simply planted on the vault without marking any change in its form. The ribs are plainly splayed, and spring from corner capitals that are of much earlier character than the rest of the building. The door connecting with the north aisle is splayed on jamb and archmould; by its side is a small door to the turret stair. Though not exposed for verification it seems likely that the original aisle wall came hard against this door. The Tower, above the ground level, has several stories; the finish of the masonry internally is very good; in all, apparently, the apartments have been considered of importance. Up at the start of the broaches are carvings; in three of the angles, of foliage, but in the north-east corner a well-executed dog picking a bone. On the cope of the parapet appears the date 1624, and this may truly apply to that exact part, but the parapet proper is earlier; the cornice on the west face is carved. The height of the tower is 70 ft., of the octagonal steeple 58 more. In the steeple are hung three bells, none earlier than the sixteenth century. Recently a small handbell of thirteenth-century date has come to light, of round form, and beaten. The turret is finished also with a detached spire; the view of the tower that includes this turret is much the best. Of about the same date as this tower and steeple was the Bishop's Palace, that lay east of the Cathedral, built by Bishop Carnock, 1429-50, of which, however, only a few fragments remain, incorporated with modern houses.

The round tower at its base, just above the plinth, is in external diameter 15 ft. 3 in., with the wall 3 ft. 8 in. thick; at the top—36 ft. 9 in. above the plinth and under the octagonal and later part—the diameter is 13 ft. 1 in., and there the wall is 2 ft. 6 in. thick. There are five stories, each marked internally by a projecting course that has supported the floors. In the first story is the door, facing west, 5 ft. 8 in. above the level of the plinth, which again is some inches above the ground below whose present surface the tower is built over 5 ft., when a rougher under-building is met with. In the third story is the first window, to the east, in the fourth is another to the south, in the fifth four facing the cardinal points. The carving of the bishops at the sides, and of the crucifix over the door, has been spirited; strangely enough two projections left for carving remain unfinished; the labour involved in reducing the whole surface of the lintel to leave the crucifix projecting must have been considerable. This lintel does not go right through the wall in one stone; the jambs and sill do—as, indeed, all the stones of the tower. What the original termination of the tower was is unknown; the present top has been added apparently in the fifteenth century, or possibly even later. A door in modern times has been made at the base, connecting with the church, but this is now built up.

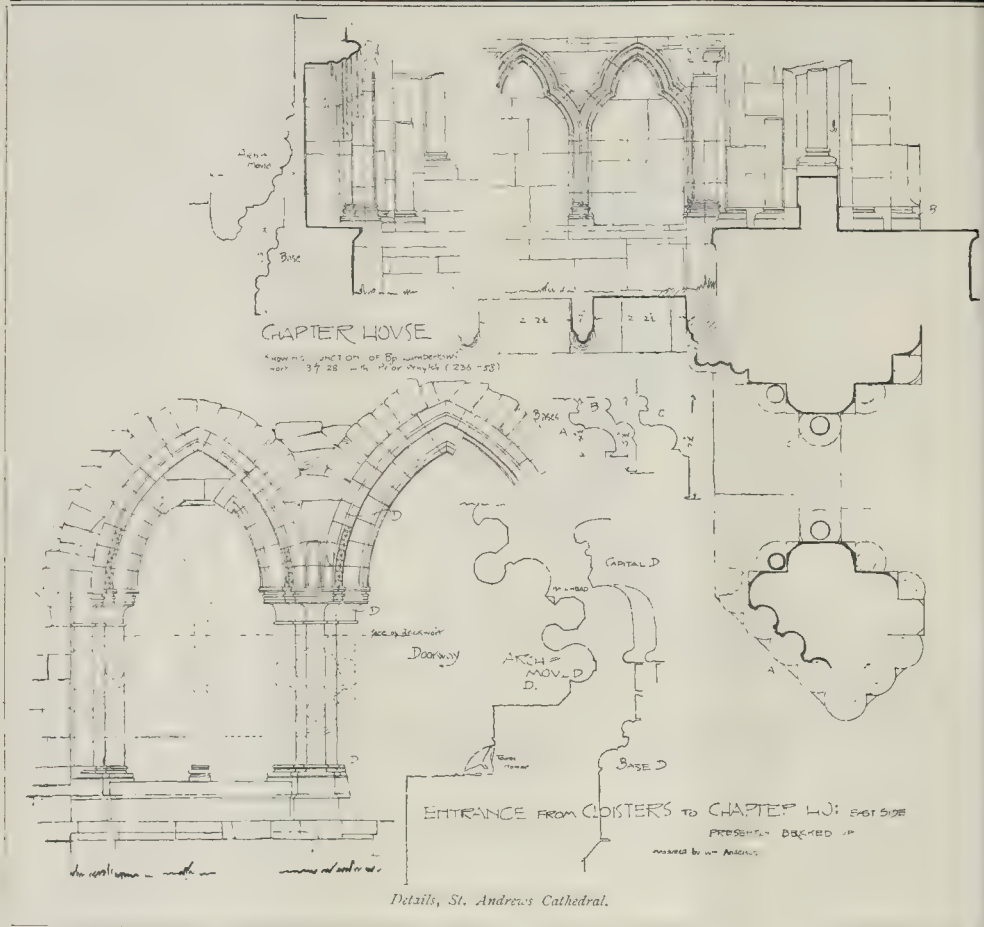
The Cathedral appears to have been quite unmo-  
lestated at the Reformation, but all records are lost that could tell how the choir came to ruin; some blame is attached to Cromwellian soldiers, but with what justice is not apparent. It would appear to be uncertain whether any traces of the east gable were extant in 1806, when the church was almost rebuilt. Irreparable damage was done at that time, the Round Tower itself narrowly escaping demolition. The aisles were widened and heightened till their roofs ran into the main roof, thus completely covering up the clearstory. In the new aisle walls the old stones are re-used, but strange string-courses were introduced with the new and enlarged windows. Crow-steps and barbarous pinnacles adorn both gables and the side buttresses. Galleries were introduced that go right round the church, and to suit the stone stairs that give access to these the responds have been reduced in very rough fashion. It is impossible that the mischief then wrought can now be wholly remedied, but much might be done; the nave should be cleared of its galleries, the aisle roofs lowered, and so open again the clearstory wall. The part of the choir that yet remains may well be regained for service if the dividing gable were abolished.

Originally there were five altars; now, within the church, there are no monuments; in the choir lies an interesting fragment of a Celtic sepulchral slab. From the centre of the nave roof hangs a brass "hearse," a chandelier for candles, now supplied with gas, presented by Bishop Lamb, 1606-10, one of the reformed Bishops; it was originally hung by a chain, weighted with a stone for balance, for lowering at pleasure. The church also possesses some excellent communion silver plate, all beaten work. The local book of reference is the "History of Brechin;" David D. Black, F.S.A., 1864.

ST. ANDREWS CATHEDRAL.

THE traveller Slezer, who made a tour through Scotland towards the end of the seventeenth century, prefaces his work on her architectural remains with a comparison of their excellence even when measured with Continental examples. "There is no country in Europe can brag either of greater piles of buildings, or a more regular architecture in its ancient churches and religious fabricrics, than Scotland was mistress of about an age or two ago. To instance, once for all, the Metropolitan church of St. Andrews was probably the biggest in Christendom, being 7 ft. longer and 2 ft. broader than that of St. Peter's at Rome; and for the height and embellishing of its pillars and roof, the beauty of its stones, and symmetry of its parts, was one of the best Gothic kind in the world." This eulogium, general or particular, is hardly borne out, but undoubtedly of Scottish ecclesiastical buildings St. Andrews was the most important in size—being over 70 ft. longer than Glasgow Cathedral, and by the same amount exceeding Kirkwall in length of transepts, while in point of merit not much inferior to the best. Unfortunately its present condition is one of complete ruin; not a fragment of vaulting remains, the walls in many places only appear above the ground, in others the very foundations have been removed. Still sufficient remains to permit of an exact idea being formed of the extent, and proves





Details, St. Andrews Cathedral.

the arrangement to have been of quite a normal type. The building consisted of a long narrow nave of twelve bays, north and south transepts of three bays each, with eastern aisles; a tower at the crossing; and a choir that for five bays of its length had aisles, but beyond that the central alley extended and formed a Lady Chapel. South of the church lay the cloisters and the rectangular Chapter House, entered through a large square vaulted vestibule; adjoining was a vaulted sacristy. The conventual buildings included a refectory, calefactory, kitchen, lay brethren's quarters, &c., with dormitories over. These buildings denote the peculiarity of this cathedral church; it was conjoined to a monastery. The Abbot was also Bishop; next in rank was the Prior, and in the case of St. Andrews his office was a most important one, owing to the closeness of its connexion with the primacy of the realm, added to the wealth of his monastery.

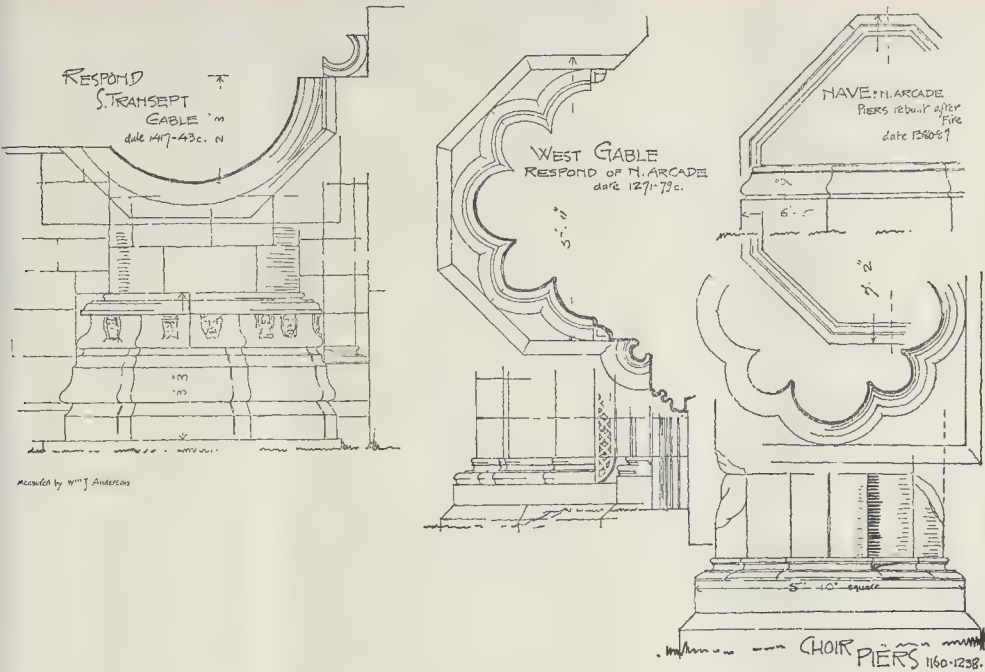
The traditional origin of the Christian faith at St. Andrews is that Regulus, a Greek monk, was in the fourth century guided to the spot, bearing with him relics of the Apostle. Investigation discredits this account; and even the more circumstantial one that gives the credit to St. Kenneth, a contemporary of St. Columba, finds little favour. The opinion is now held that the true founder was a bishop of Hexham, who, in 732, had to flee his country, and, journeying northwards, found safety in Pictland, and there founded a bishopric. The facts of Bishop Acca's leaving Hexham and his founding a church seem certain; and Whithorn, in Galloway, has generally been designated as the place of his sojourn; but the probabilities of dates tend rather to favour the belief that St. Andrews was where the Northumbrian bishop settled. Though Saxon influence originated this northern church, for two

centuries the officers were native, the names of the bishops for that period being Celtic; but towards the close of the eleventh century English influence revived in Bishop Turgot, a monk of Durham, and Confessor to Queen Margaret. In 1124 Bishop Robert, another Englishman, founded a Priory of Canons. Even before Turgot's time the Keleddie or Culdee Church had greatly deteriorated, many of the offices in it having become hereditary; but within it had arisen a reforming party, whose aim was to revive stricter discipline and Regular monastic life. In time there was a severance; each section retained a part both of temporalities and spiritualities; but the influence of the English bishops, and latterly the Crown, was with the new party, who gained ground, and within forty years of their establishment the priory of Austin Canons was formally possessed of all that had belonged to the reformed section of the earlier community. The methods by which the canons imposed their principles on the Keleddie of the island of Lochleven, gifted them by royal favour, were distinctly oppressive and arbitrary. Yet the Culdee Monastery continued; their original church on the Kirkhill, not many yards north-east of the present cathedral, in mere outline is still preserved; the members for a time exercised their right of participating in the election of the bishops, but their feebleness permitted them to be overcome, the privilege was denied them, and their protests disregarded; their name disappears from all records by 1332.

The church and tower of St. Regulus that adjoins the Cathedral is supposed to date from about the beginning of the twelfth century, possibly even earlier, and is believed to have served the purpose of a diocesan church separate from that belonging to the monastery.

It consisted of a western tower, small nave without aisles, and an apsidal chancel, now gone. Later an addition, also gone, west of the tower, was added, for the use, it is presumed, of the newly-founded priory. In this church of St. Regulus, until 1202, successive bishops were buried. The square tower is the loftiest of the five ante-Norman ones that Scotland possesses; all contained, too, within the adjoining counties of Perth and Fife.

The present Cathedral church was begun in 1160 by Bishop Arnold, who formerly had been Abbot of Kelso, and so possibly had some share in the erection of the church there, thus accounting for the undoubted resemblance that the later bears to the earlier building. The portion first completed included the choir, transept—with the tower at crossing—and three bays of the nave, and seventy-eight years was occupied in the operation. And though in that time the style elsewhere had progressed, Arnold's original design was adhered to; and even for long afterwards, when the style was changed, the early proportions were retained in the close centre of the nave arches; to the end narrowness and height were relied upon for the architectural effect. Bishop Malvoisine, who had the distinction of so far completing the church, was the first prelate buried within its choir north of the high altar. In 1236 new monastery buildings were begun by Prior Whyte, but these have been replaced later; of his work there only remains the vestibule to the Chapter House, that originally itself was the Chapter House, and the sacristy; that is in the buildings of the monastery proper, for a little way distant remains yet the noble Guest Hall, also the work of this energetic Prior. In 1264 there was added to the monastery a common hall. During the episcopate of Bishop



Details, St. Andrews Cathedral.

ishart, 1271-79, work was resumed on the nave and thereafter continued, considerable progress being made before the interruption caused by the War of Succession. After Bannockburn falling was resumed under Bishop Lamberton, when it would appear that then the original intention as to the extent of the nave was modified; and the west gable is now seen to be a couple of bays or so east of its intended position. That this is the result of an afterthought is further proved by the gable not being bonded into the side walls. The marks of vaulting evident on its west face may mean that a Galilee porch was intended, if not added, utilising thus the aisle walls that remained projecting westwards. Record is made of much carving of bosses in the vaulting and insertions of capitals; those of the nave aisle-wall yet remain, but of softer stone; they are now much weather-worn. A greater work of Bishop Lamberton's was the building of a new and larger Chapter House, the existing one being retained as vestibule; thus in 1318 the church with its Chapter House stood complete. In 1340, under Prior Williams, additions and alterations to the monastery building followed; the cloisters were re-roofed, the refectory and other parts repaired; he also added furniture to the church. In 1378 befel a great mishap, a fire that would seem to have affected most disastrously the nave; so much may be inferred from the bare bases of piers there that alone remain; as the mouldings agree with the date of the building that was at once begun, we may believe that the destruction of the nave-roof involved the north wall, at least, of the nave as well. A rhyming-translator repeats verses too-romantic account of the crow that, tiring with a lighted twig, occasioned the fire. The choir is known to have been rebuilt, but whether at the general re-edification after the fire or later, is uncertain; the great angle buttresses at the east end were mainly added by Bishop Haldenstone, 1419-43. The gable is seen to be rent from top to bottom, the result of the vault thrusting at a place where there were no aisles to resist it. Possibly by way of repair, rather than from mere desire of architectural magnificence in the style current, the small early windows were replaced by the large ones. Most likely at the same time the conical terminations to the east gable pinnacles were added, and possibly, too, the respond in the south transept, necessitated by some collapse or weakness of the arcade there. Before this time the

tower itself, showing signs of weakness, had been strengthened by supports, whose lower parts yet remain. The cathedral was then finally completed by the middle of the fifteenth century. As for the monastery, when or by whom the buildings on the west side of the cloister were added, is unknown, they have now almost all disappeared, the position and dimensions of the refectory are only positively known from records so late as 1685 that describe the buildings when they were then partially alienated from their original purpose. The fine vaulted gateway, just south-west of the Cathedral, known as the "pend," was built in the fifteenth century; more precisely is not known. In 1516-20 the great wall surrounding the monastery grounds, and which abuts against the east gable of the Cathedral, was built by Prior Hepburn. It is quite an important work in itself, having several watch-towers and gateways. There has been a corbelled battlement: the niches and other embellishments are seen to be in some cases made out of fragments of earlier carved work. In 1466 St. Andrews was raised to the dignity of an Archbishopric, and claimed the obedience of the twelve bishoprics of Scotland. The first prelate, the unfortunate Patrick Graham, accepted office against the wishes of the King, who confined him to the island of Lochleven, where he died. How it came about that this Cathedral and Monastery, once so complete and so extensive, should now be a ruin, is generally explained by a reference to Reformation zealots, but this is quite insufficient; their fury only affected the monuments and church furniture and decoration, the fabric was uninjured. The true reason is apparent—the inherent weakness of the structure. The tower and nave north aisle specially were not over stable; outside the latter, opposite every pier, are foundations that prove supports to have been required. Dislocations at the east gable and south transept have been referred to. In the town church the citizens had accommodation that sufficed for their requirements, and the Cathedral, left tenantless, readily fell into disrepair, and on the first breach, and a use found for the cut stone in building operations, its demolition was assured. By Parliamentary grant the Town Council were permitted to employ the materials for the city wall. Only so late as 1650 did the half of the west gable collapse. The monastery fell into private hands; its buildings were put to various uses, altered, and so

gradually disappeared. For long a fair was held within its precincts, and later a modern mansion built in its midst. This house has recently been acquired by Lord Bute, who is having excavations made; so far only what has been expected in the way of walls has been laid bare. The oldest carved stones about the Cathedral are some fine Celtic slabs built into the east gable with their edges exposed, under the level of the choir floor; it is only quite recently that they were noticed; the twelfth-century builders are thus shown to have been quite as deficient in respect for ancient work, for such these were to them, as any of their successors. The large slab that once covered the built tomb, supposed to be Archbishop James Beaton's, that lies south of the high altar, has apparently at one time been covered with metal plates, now, of course, gone. Round the walls of the Chapter House vestibule and the sacristy are ranged a number of very interesting carved tombstones of late seventeenth and of eighteenth century date. Of the earliest work the capitals, where they exist at all, are well preserved; of the later work, especially at the west gable, both carved capitals and mouldings generally, being of a softer stone, have very much decayed. About six years ago, under the direction of Mr. David Henry, F.S.A., Scot., the lines of the Cathedral were ascertained by digging, and then marked out on the turf. Mr. Henry has interested himself for years in the building, and from his researches much of the foregoing information has been obtained.

DESIGN FOR A COUNTRY HOUSE.

THESE elevations for a Country House were exhibited at the last Royal Academy exhibition, and are the design of Mr. Gerald C. Horsley. As it will be seen, the special feature in the design is the introduction of bas-relief subjects on the exterior walls, the subjects in the gables of the entrance front representing music and dancing, those on the elevation to the garden the Four Seasons. As regards the plan, we hardly think the drawing-room would be found a very comfortable room with the doors opening on each side of the fireplace, any more than would the dining-room in Mr. Blomfield's plan of a house published in our issue of January 13. There is too much tendency to neglect these points in the comfort of house-planning, among some of the architects whose houses are no doubt among the most interesting to look at. As Bacon says, "Houses are built to



live in, not to look at;" and though that is perhaps putting it a little too broadly, it serves to call attention to a side of the matter which seems to be getting overlooked.

#### ARCHITECTURAL SOCIETIES.

**CARLISLE ARCHITECTURAL, ENGINEERING, AND SURVEYING ASSOCIATION.**—A meeting of this Association was held on the 24th ult. in the Town-hall, Mr. Higginson occupying the chair. A lecture was given by Mr. C. Lonsdale on "Some Trees and their Uses." Commencing by tracing the growth and formation of a tree from the plantation of the seed until it attained the proportions of a tree suitable to be cut down for the uses for which timber is indispensable, the lecturer proceeded to give a detailed description of the species and botanical divisions of most of the trees grown or in use in this country, with the purposes for which each wood is used. The necessary three samples of each of the woods in general use were shown, together with samples of other woods. The manner in which the balks are cut up to procure the maximum amount of wood, and the general and most useful stock sizes from each tree, and the methods of storage and seasoning necessary to prevent "tainting," were points which the lecturer explained. A vote of thanks was unanimously accorded to Mr. Lonsdale for his lecture.

**NORTHERN ARCHITECTURAL ASSOCIATION.**—A meeting of the members of the Northern Architectural Association was held in the Art Gallery, Newcastle, on the 24th ult., Mr. Oswald presiding, when Mr. Charles E. Oliver, F.S.I., read a paper on "The Timber Trees of New Zealand." He said that, although it was not likely that New Zealand woods would be commonly used in this country, he thought it was highly probable that some of these woods ere long would be imported here at a price which would win for them a prominent place in our wood markets. New Zealand is so well watered and so well adapted to the growth of timber, that, even when forests are cut down, they soon reproduce themselves; but this was no excuse for the wanton waste which often takes place after trees have been felled for timber purposes. The forests are known to contain upwards of forty distinct varieties of timber trees, more than twenty of which were suitable for architectural work, cabinet-making, and many other purposes. For some years past Kauri has been imported into this country. It appeared to him that if Kauri, the most costly of the New Zealand timbers, could be imported here at a price enabling us to use it freely, he thought the same might be done with many other woods, such as the red pine, black pine, totara, &c. The indigenous forest of New Zealand is ever green, and the general character of the woods resembles the growths of Tasmania and the Australian Continent. Most of the woods are harder, heavier, and more difficult to work than the European and North American timbers. They vary, however, very much among themselves, and are mostly very durable. The majority of the trees rise to a height of forty or fifty feet before putting out their branches, a detail which ensures the production of a large amount of clean, regular-grained wood of great size. On the motion of Mr. Taylor, seconded by Mr. J. T. Cackett, a vote of thanks was accorded to Mr. Oliver.

**GLASGOW SCHOOL OF ART.**—The fifth of a series of lectures under the auspices of the Glasgow School of Art, by Mr. William J. Anderson, A.R.I.B.A., was delivered on the 24th ult., in the Corporation Galleries, Glasgow. The special division treated of was "The Culmination of the Renaissance in Rome." This was distinguished from earlier periods partly by the suppression of elements of design foreign to Classical taste, as well as by a greater facility in composition, richness of modelling, and artistic reserve. In the period embraced between the years 1506-1550 all art subsequent to that of Greece culminated. In so far as it was a resurrection of Antique art it was appropriately and naturally consummated in the heart of the ancient world, for Rome at this time had recovered some shadow of its former prosperity, and had become once more in a limited sense the capital of Italy. If it did not wield its empire over Italy as in former days, it became the centre of an influence which had moulded the art and architecture of the civilised world more than any other. Brief sketches of the lives and works of the leading architects of the time were given by the lecturer, and an analysis of the Roman Palazzi followed, with

numerous illustrations. The history of St. Peter's Cathedral was considered in detail, plans and projects of various architects being shown on the screen, together with elevations and views of the existing fabric.

#### THE LONDON COUNTY COUNCIL.

The usual weekly meeting of the London County Council was held on Tuesday in the County Hall, Spring Gardens, Mr. John Hutton, Chairman, presiding.

**Technical Education.**—The adjourned report of the Finance Committee was brought up, containing a memorandum from the Technical Education Board in reference to the disposal of the grant made last year for technical education. The Committee recommended:—

"That, subject to an estimate being submitted by the Finance Committee as required by the statute, the Council is of opinion that the sum of £7,000, to be paid out of the amount receivable by the Council under the Local Taxation (Customs and Excise) Act, 1890, should be appropriated and contributed in respect of the year ending March 31, 1895, for the purposes of technical education, and that it be referred to the Finance Committee to submit to the Council the necessary formal resolution."

Mr. Campbell moved:—"That the recommendation be referred back to the Committee with an instruction to consider whether the suggested grant should be increased to 90,000."

The amendment, which was seconded by Mr. Crooks, was negatived by a large majority, and the recommendation of the Committee was agreed to.

The Technical Education Board brought up a report which stated that the Board has formulated the conditions under which it will make grants in aid of schools of art and art classes. The Board has had the advantage of the advice of Mr. Ed. R. Taylor, head master of the Municipal School of Art in Birmingham. The main objects which have been borne in mind in framing these conditions have been (1) the grant of substantial encouragement to efficient art teaching in all parts of London; (2) the provision of new and increased teaching apparatus; (3) the abolition of the farming system; (4) the promotion of instruction in the schools of art of some artistic handicraft; (5) the efficient organisation of the classes, and a diminution in the number of students under one teacher; (6) the introduction of black-board demonstrations when desirable; (7) special attention to design; and (8) the encouragement of classes within the reach of the artisan population. In order to encourage the more systematic study of art, especially by artisan students, the Board has decided to award in June next not more than two evening art exhibitions, twenty artisan scholarships, and twenty schools of art scholarships. The scholarships and exhibitions will be awarded after examinations in freehand and geometrical drawing, including design, in accordance with the circular which has been circulated to the Council. The Board has received deputations from the Worshipful Company of Plumbers, and the Technical Education Committee of the National Conference of Painters and Decorators, to urge additional provision for instruction in their crafts. To meet the demand thus expressed, the Board has announced its intention of making grants in aid of evening classes in technology under certain conditions. In offering aid to these classes, which include the subjects on which aid is granted by the City and Guilds of London Institute and any other applications of science or art to industry which the Board may approve, it has been the object of the Board to secure that (1) all practical instruction should be associated with training in drawing, mechanics, mensuration, or such other subjects as may be essential to the proper understanding of the workshop practice; (2) that the teaching of such subjects as plumbing, brick-laying, joinery, &c., should be confined to students who are bona-fide members of the respective trades; (3) that the number of students under one teacher should not be too large for efficient instruction; (4) that the classes should not be starved for want of material; and (5) that the teachers should be paid mainly by fixed salaries, and in no case by grants on examination results.

**Sewer Examinations.**—The adjourned report of the Main Drainage Committee contained the following paragraph, the recommendation, after a short discussion, being agreed to:—

"Referring to our report to the Council on January 16\* on the result of sewer air investigations carried out by Mr. J. Parry Laws, we have now

received a report from the chemist and Mr. Laws stating what further experiments should, in their opinion, be made with the view to obtaining further information with reference to the organisms in sewer air. They consider that, as a precise knowledge of the various micro-organisms occurring in sewage will doubtless considerably strengthen the important conclusion already arrived at that the micro-organisms of sewer air are derived from micro-organisms of fresh air and not from the micro-organisms of sewage, it is most desirable to study the micro-organisms existing in sewage under various conditions with a view to classifying them, and determining the relative frequency with which each different species occurs, and they also suggest that as it will be necessary to determine whether some of the organisms isolated from sewage possess pathogenic properties Mr. Laws should be associated with Dr. F. Andrews in this particular investigation. The inclusive fee for this investigation and report would be 12s. 6d., in addition to 30s. for apparatus. Having given careful attention to this matter, and having conferred also with the medical officer, we deem it advisable that these investigations should be continued in the manner proposed, and we accordingly recommend—

"That subject to an estimate being submitted to the Council by the Finance Committee as required by the statute, the Committee be authorised to retain the services of Mr. Laws and Dr. Andrews for the purpose, at a total cost, including apparatus, of 150s."

#### Proposed New Pumping Station at Heathwall.

The same Committee reported that they had had under consideration for some time past the necessity of dealing more efficiently with the storm waters entering the southern low-level sewer. The preliminary approximate cost of the proposed new station, including that of the property required, is 18,000. The property consists of land and premises adjoining and at the rear of a house in Nine Elms-lane. The following recommendation of the Committee was agreed to:—

"That the Council do approve of the proposal to erect a new pumping station at Heathwall, and that the solicitor be instructed to take the steps prescribed by Section 153 of the Act 18 and 19 Vict., cap. 120, with the view to an application being made to the Home Secretary for power to acquire the property referred to."

#### The Purchase of Tramways.—The Highways Committee recommended:—

"That the Council do appeal against the decision of the Queen's Bench Division of the High Court sending back to the arbitrator his award of the amount to be paid by the Council for the undertaking authorised by the London Street Tramways Act, 1870, and that the Highways Committee be authorised to take all necessary measures for the purpose."

This was opposed by Colonel Rotton and others, but the recommendation was carried.

#### The Fair Wages Question.—The Parks Committee brought up the following recommendation:—

"That the men at present employed at parks and open spaces as lavatory attendants and caretakers, and who are in receipt of wages less than 2s. a week, be in future paid at that rate."

Mr. Torrance, the chairman of the committee, declined to formally move the adoption of this recommendation, on the ground that he dissented from it.

Mr. Frank Smith moved its adoption.

A motion to adjourn the matter *sine die* having been lost, after a long discussion, a show of hands was taken on the recommendation of the committee, and resulted in a tie. On a division the recommendation was adopted by fifty-eight votes against thirty-four.

**Private Bills Introduced by the Council.**—The following Private Bills to be promoted in the coming Session of Parliament were announced by the Parliamentary Committee. London County Council (Improvements), London County Council (Tower Bridge, Southern Approach), London County Council (Water), London County Council (General Powers), and London Streets and Buildings. They came before the Examiner on the 18th ult., and, with the exception of the Water Bill, were declared by him to have complied with the Standing Orders. The Water Bill had been referred to the Water Committee, to consider the course to be adopted when it came before the Standing Orders Committee.

**Capacity of Water-closet Flushing Cisterns.**—The Public Health and Housing Committee brought up a report in reference to the question of the capacity of water-closet flushing cisterns. After referring to the recent decision of the Council on a previous recommendation\*, the report proceeded as follows:—

\* See Builder for January 20, page 53.

\* See Builder for December 16, page 451.



The Council's views were communicated to the Local Government Board, and the Board now points out that the scope of the regulations referred to is limited to the prevention of waste, misuse, undue consumption and contamination of water, and calls attention to the fact that recommendation (a), as made by the Council, cannot be considered as having for its object the prevention of either waste, misuse, or contamination. We agree with the Board in these remarks, and, under the circumstances, have no alternative but to repeat our recommendation, which was to the effect that the cisterns should be capable of discharging more than three gallons. The Council could, if thought fit, make a bye-law, under section 39 of the Public Health (London) Act, 1891, prescribing a minimum capacity of flushing cisterns, but, as the bye-laws under this Act have so recently come into operation, we do not advise the Council to take any course at present. We propose, however, to consider this point when the bye-laws are revised. The Local Government Board suggests that the most convenient method of bringing the question to issue will be for the Council to make formal application to the water companies under section 10 of the Act of 1871 to make such alterations as the Council may judge to be reasonable and as are granted by the Act; and that, in the event of the companies' refusal, it will be competent for the Board to proceed in the manner directed in the section. It accordingly recommends:—

That the Committee be authorised to make formal application to the London water companies for the amendment of their regulations in the particulars specified in the recommendations made by the Committee to the Council in December last. . . . .

The recommendation was agreed to.

**National Exhibitions Building.**—The Theatres and Music Halls Committee's report contained the following paragraph, the recommendation being referred to:—

"We have received from Mr. A. O. Collard, on behalf of Mr. V. A. Applin, certain drawings showing proposed arrangements for the forthcoming exhibition to be held on the site of the National Exhibition Buildings, Earl's Court. The general sketch plan shows that the whole of the present buildings are to be removed, and a series of new buildings, adapted for various purposes, erected in their place. Full detail drawings of each building from time to time be submitted for the approval of the Council. We are now in a position to report on the building which is to be used for spectacular purposes, and which will be fitted with seating accommodation for 5,000 people, and will be provided with a stage and dressing-rooms. The details of this theatre have also been considered by the Building Act Committee, who have notified to us their approval of the application, subject to the engineer of the Council being satisfied as to the construction of the building. Certain of the plans of the theatre laid before us on January 10, 1894, have been amended by small alterations since received, which provide a further improvement of the stage and improve the gallery staircases, and are in most respects satisfactory. The three plans which we now submit for approval are the following:—1. Ground plan; lower circle. 2. Second floor plan; boxes and promenade. 3. Third floor plan; upper circle. Further drawings, showing the details of the construction of the galleries, are to be submitted to the Council. Meanwhile, in order that the works may be proceeded with, we recommend:—

That the three plans referred to above presented to the Theatres and Music Halls Committee on January 10, 1894, amended by the flap drawings presented to the Committee on January 24, 1894, be approved on the following conditions:—

- (a) That the buildings be constructed to the satisfaction of the Engineer of the Council.
- (b) That the gallery gangways to the staircase on the east side and the staircase on the west side of the gallery be supported to the satisfaction of the Council.
- (c) That detail sections of the trusses supporting the seating be furnished to the satisfaction of the Council."

**Proposed Ground Plan of London.**—The following motion, in the name of Mr. Crooks, was the paper:—"That it be referred to the Corporate Property Committee to consider the expediency of getting together materials for preparing a ground plan of London, showing the various ownerships, and of making a register of London landowners and to report what expenditure they would think necessary and would commend the Council to incur for the purpose." The objection was taken to this inquiry, on the ground of its expense, a Councillor stating that it would cost thousands upon thousands to carry it out, and another that the Council had not the financial power to do it. Mr. Crooks explained, however, that it had reference to ground landlords only.

The motion was agreed to.

**Public Convenience, Westminster Bridge.**—The following recommendations of the Bridges Committee were agreed to:—

- (a) That the work in connection with the forma-

tion of a public convenience at the west end of Westminster Bridge be executed by the Council without the intervention of a contractor, and that the specification and estimate be referred to the Works Committee for that purpose.

(b) That the tender of Messrs. B. Finch & Co., amounting to 1,451. 10s., for the sanitary work in connection with the urinal and lavatories, be accepted.

(c) That upon the completion of the work, the convenience be transferred to the Vestry of St. Margaret and St. John, Westminster, upon the terms and conditions mentioned in the Committee's report, and that the terms and conditions be embodied in an agreement to be prepared by the Solicitor."

The Council adjourned at 7 o'clock.

## Books.

*The Mechanics of Hoisting Machinery.* By Dr. JULIUS WEISBACH and PROFESSOR GUSTAV HERRMANN; translated by KARL P. DAHLSTROM. London: Macmillan & Co. 1893.

FOR the production of this practically important treatise in English print we are indebted to Mr. Karl P. Dahlstrom, late Instructor of Mechanical Engineering at the Lehigh University. The second German edition, from which the translation has been made, is recognised by various scientific institutions all over the world as an able text-book for technical schools and a guide for practical engineers, in its dealing with the mechanics of hoisting machinery, including accumulators, excavators, and pile-drivers. In the letterpress, references are made to the English translations of Weisbach's Mechanics. The metric and British measurements are used, the latter being enclosed in brackets. The authors endeavour in every case to deal with the efficiency of a machine. They show that hoisting machines are usually driven by a rotating shaft, because if worked by a lever in the place of gear wheels, its oscillating motion would subject the machine to many inconveniences in hoisting or lowering. They recommend the application of graphical methods for determining the power to be applied and for ascertaining the efficiency of hoists, as simpler than the numerical calculation, particularly when drawings of the machine are at hand. By constructing a diagram sufficiently large, we obtain a degree of accuracy which suffices for every case. The principles of graphical statics to determine the effort required to operate a jack-screw are investigated, and the authors show that owing to their small efficiency, screws should not be employed in hoisting apparatus intended for continuous and heavy service. On the other hand they may be advantageously used for apparatus needed to run intermittently, on account of the security they insure against running down by virtue of their self-locking property. It is interesting to note that in a screw-apparatus in which the nut is turned, a smaller efficiency results than in those machines in which the spindle of the screw is turned. In differential screw-jacks a load can be lifted by imparting rotation to both screw and nut. To hoist heavy loads speedily, windlasses are often used, combined with a small steam-engine where no other source of power is available. Steam hoisting-engines are largely adopted in mines. In Germany the engine cylinders are generally made horizontal, while in England vertical beam-engines, or engines of the inverted type, are largely employed, the latter type with a view to give the drum as high a location as possible, by which arrangement the bend of the hoisting rope around the guide pulleys is reduced to a minimum. Compressed air and electric motors are sometimes introduced. In the former case, the air is compressed by steam or water-power, and afterwards used in a motor, coupled to the hoisting-machine. The losses connected with the use of pneumatic apparatus are due to the fact that for every operation the lifting-cylinder must be filled with air of the required density, which necessitates an expenditure of a corresponding amount of work that is lost. The efficiency of pneumatic hoists decreases as the ratio of densities increases, and the result is more unfavourable in vacuum lifts than when compressed air is employed. In places where the water-mains give sufficient available head or pressure, hydraulic hoists may be conveniently introduced as they do not then need a special prime mover, but since water is practically incompressible it is necessary in all hydraulic hoisting machinery to use special precautions against shocks which occur when masses in motion are suddenly checked. Elevated reservoirs are introduced between the prime source of supply and the lift,

They act as accumulators, and their use, as well as the service of relief-valves in a pipe connecting the hoist-cylinder with the valve chamber of the water service, is fully described in the book before us. For machinery which is to work continuously, the accumulator is not an advantageous prime mover on account of its indirect mode of action, but when a large number of hoists are to be worked at once by a single prime mover the indirect system is a convenient and sure way of easily distributing the required energy to considerable distances. Cranes and sheers, excavators and dredgers, pile-driving machines, are fully considered, while a description of hoist employed in making the Suez Canal adds to the interest of a well-illustrated and exceedingly valuable addition to professional literature.

*Notes on Cylinder Bridge Piers, and the Well System of Foundations.* By JOHN NEWMAN, A.M.Inst.C.E.: London, E. & F. N. Spon. 1893.

REFERENCE to the table of contents and to the index provided to this book shows that most of the chief points requiring attention in the design, sinking, or erection of cylinder piers or wells, either by compressed air, dredging, or open trench work have been dealt with by the author; and upon a perusal of the eighteen chapters which form the volume, we find a good deal of practical information, most of which only exists elsewhere in a scattered form in the transactions of professional and scientific societies, and in various articles of the engineering press. The author has done well to collect this information into one book, and he has taken this opportunity to add numerous hints, alike useful to the resident engineer, bridge builder, contractor, and last, though not least, the student. The iron cylinder system of bridge foundations is not economical if many cylinders have to be sunk close together; the most efficient employment of that method is where one cylinder is sufficient for a single girder of a bridge, and where only two to four cylinders are needed for one pier. The system is frequently adopted for foundations in deep water, and of considerable depth in the ground. Experience leads engineers nowadays to prefer one or two large cylinders to be used instead of many smaller ones, as they can be sunk with much greater certainty, and at a less proportionate cost than several smaller cylinders. Moreover, they are not so liable to get out of the vertical in sinking. In cases where the distance between two cylinders is not greater than the diameter of the cylinder, they have preferably to be sunk alternately, as there is a tendency, when they are being sunk simultaneously to draw towards one another. The well system is economical in sand or silt, and where the water is of moderate depth, and when the depth is too great for the employment of compressed air, provided special plant and excavating apparatus is used. The vacuum principle of sinking cylinders has been generally abandoned in favour of the compressed air method. The main points in sinking by means of compressed air are to supply sufficient air for the expulsion of the water, and for the men in the working chamber, the latter being so designed as to provide for the ready entrance and exit of the workmen, for the introduction of plant and the casing, and for the removal and discharge of the material excavated. The author thinks it is questionable whether the compressed-air method is the best system to employ at depths greater than from 80 ft. to 100 ft. below water-level, and that, except under special circumstances, he would not recommend it for depths less than about 25 ft. below water, but that the depth for its economical adoption, he must admit, is not easy to determine. Excavating and dredging apparatus for removing the earth from the interior of an open well or cylinder are fully investigated. The well system has failed when boulders and obstructions in sinking have been encountered. For loose sand, mud, and silt the well system is particularly adapted; and among the pumps used for pumping sandy water may be named the centrifugal, rotary, pulsometer, and chain pumps. Their use, however, necessitates lifting a large quantity of water with the sand, and thus much of the power applied is wasted, and perhaps a "run" of earth is induced by a flow of water being caused. Experience has shown that where sand pumps are used it is better to work by bands and not by gearing, i.e., by a yielding medium in preference to rigid driving, because in the event of a pump becoming choked less injury results to the machinery by a sudden shock. The author describes the dredging apparatus employed at the harbours of Calais, Dunkirk, and elsewhere. While every case of a separate foundation must



be dealt with independently, there is much to be learnt from the study of Mr. Newman's book relating to the construction of bridge, quay, dock, weir, and river wall foundations.

**Theoretical Mechanics.** By ALEXANDER ZIWET. Two vols. London: Macmillan & Co. 1893. THE author of these two volumes, who holds the position of Assistant-Professor of Mathematics in the University of Michigan, has treated the subject of Kinematics in Part I., and of Dynamics and Statics in Part II., in a purely theoretical manner, assuming that his readers have acquired a knowledge of the elements of higher mathematics, it being the custom in many American colleges to reserve the practical study of mechanical science until considerable advance in mathematical knowledge has been attained. In this country, the study of mechanics is taken up at an earlier stage of the student's course. To the advanced student, the work of Professor Ziwet will be especially welcome. Theoretical knowledge is essential to successful practice. There are some excellent examples at the end of each chapter which a mathematician will rejoice in working out, and answers are supplied at the end of each volume. It is the experience of every student that a subject which is not perfectly clear when studied from the writings of one authority may become intelligible, and, consequently, the property of the mind when the data, furnished by another authority, are perused. We are glad to note that prominence is given to geometrical methods and graphical constructions wherever possible, because such methods seem to conform best to the nature of the subject. The applications given here and there, are to be regarded merely as illustrations of the general principles enunciated. The fundamental laws of dynamics can, of course, only be fully understood by studying kinetics, and the consideration of this branch is promised as Part III., to be ready towards the end of the present year.—The three parts will form a valuable proof of the utility and importance of purely mathematical training to practical application of science.

**Injectors: their Theory, Construction, and Working.** By W. PULLEN, Wh.Sc., A.M.Inst.C.E. Manchester: Technical Publishing Company, 1893.

WE are pleased to welcome this little volume, as there is a paucity of books dealing exclusively with the subject of injectors, and the value of the present treatise is enhanced by the fact that the author's diagrams are not mere sketches, but are selections copied from drawings which accompany patent specifications, in addition to those supplied to him by manufacturers. Prior to the invention of M. Giffard, a French engineer, who took out a patent in 1858 for an injector, such high-pressure boilers as then existed, as well as low-pressure boilers had to be supplied with water by pumps; but upon M. Giffard's bringing out a means of forcing water into a boiler by the motion imparted from the high velocity of a jet of steam impinging upon the water at rest, the invention was speedily introduced into England by Messrs. Sharpe, Stewart, & Co.; and in tracing its development in this country, the author adds to the value of the theory of the working of an injector, which he fully discusses, by furnishing diagrams showing the construction of various standard injectors, among which we have illustrated those in use upon the London and North-Western and Great Western Railways. The author gives an honest account of various applications of the injector, free from the eulogistic paragraphs often found in sale catalogues, and he calls special attention to the importance of rendering the live steam entirely automatic and independent of the driver or fireman, so as to ensure automaticity in restarting. An interesting historical notice concludes the volume.

**Concrete: its Nature and Uses.** By GEORGE L. SUTCLIFFE, A.R.I.B.A. London: Crosby Lockwood & Son. 1893.

OUR readers are already familiar with the main portion of the text in this useful little volume, but numerous additions are introduced into the book in its present form. The original appeared as our "Student's Column" during the latter half of the year 1892, and, coupled with the extra information contained in the bound volume before us, which the space allotted weekly to our "Student's Column" articles did not admit of our publishing during this limited period of six months, we have now the advantage of continuity of matter and of a copious index. The compo-

nent parts of concrete are carefully classified, and their treatment in the formation of concrete ably dealt with. The application of concrete to foundations, walls, floor beams, floor surfaces, roofs, and stairs is thoroughly investigated, and the author deserves credit for quoting his authorities. The work is stated to be "a book for architects, builders, contractors, and clerks of works," but we have no hesitation in adding that many civil engineers will also derive profit from its perusal. The results of experiments are skillfully tabulated, and the letterpress is well illustrated.

## Correspondence.

To the Editor of THE BUILDER.

### PRIME COST.

SIR,—For a "Builder's Manager," who must be acquainted to some extent with the making up of accounts for works carried out under the almost general way—viz., of a lump sum contract, with a priced out bill of quantities deposited as a schedule, for the purpose of adjusting variations—to suggest in your issue for the 20th ult., the "knocking something off the main total," or "putting the fixing at a low rate," cannot possibly tend to induce those who have the arranging of contracts to quote list prices instead of giving P.C. amounts.

In the first place, how can a bill of quantities priced out in the way he suggests form an accurate schedule? Surely he would not propose the extremely inconvenient way of taking off a percentage throughout the whole of the bill, to equal this "knocked off lump sum," and why, indeed, should the "fixing" be put down at a lower figure than it ought to be to set against some trade or other discounts?

If articles can be selected from manufacturers' lists there can be no necessity, either for giving the list prices or the P.C. amounts. As a rule, when P.C. amounts occur in bills of quantities, they are to cover some special work or goods that most probably the architect has not finally decided upon, or even as to which firm of manufacturers he will go to for them. List prices cannot possibly be given in cases of this sort.

It must be apparent that a builder pricing out a bill of quantities can include any percentage he likes for profit on these P.C.s, just as well as if he had a figure given which included for some—perhaps uncertain—amount of discount, and did it in one of the more roundabout ways suggested by a "Builder's Manager."

The parallel tried to be obtained between dealings in groceries, drapery, &c., does not commend itself as being very applicable, as in the former case the buyer and seller come in direct contact, and it is open to the former to purchase or go elsewhere, whilst in building matters it is certainly inconvenient, and sometimes impracticable to go elsewhere, which would mean having men at work upon a contract not under one control.

For a "Builder's Manager" to talk about a quantity surveyor receiving 2l. 10s. for the mere writing of a couple of lines to stipulate that roof is to be provided for a certain piece of work, shows pretty clearly that he has but feeble knowledge of a surveyor's duties. When a surveyor has to write letters, interview specialists, and sometimes do a host of other things to arrive at a proper amount to provide, he is not quite so well paid as your correspondent would like to make out.

H. RILEY.

### MONTPELLIER BATHS, HARROKATE.

SIR,—In last week's issue of the *Builder* you refer to the list of tenders sent by me for the above buildings, and, as you have given your view of the matter, perhaps you will allow me to give mine.

You say you were "surprised to see my name attached to the list instead of the architects," and concluded that the Borough Surveyor had prepared the quantities.

Am I to infer that you know so little of what is in your own paper that you did not know who had prepared the quantities? A long advertisement was inserted in the *Builder*, along with the other technical papers, three consecutive weeks—viz., November 25, December 2, and December 9, setting forth in full the names and addresses of the architects as well as the quantity surveyors, and this advertisement was signed by myself (on behalf of the Corporation), stating that the plans, &c., could be seen, and quantities obtained, at my office, and yet "you concluded that the Borough Surveyor had prepared the quantities."

The reason my name was coupled with the list of accepted tenders was briefly this. As soon as the Council accepted the tenders I prepared a *lithographed circular* giving the names of the successful contractors, and this was sent to each of the parties tendering, with a note stating that the guinea deposit was returned at the same time.

Now, it was a copy of this circular with the amounts of the tenders inserted, and the foot-note crossed out in red ink (to save time), which was sent to the *Builder* as well as the other technical papers.

I enclose another copy of the lithographed

circular, which was sent to you at the time in order that you may see how utterly uncalculated for was your insulting paragraph, and that with apparently due care that his name should appear prominently in connexion with the work."

Your readers will understand, when I state this in connexion with these quantities I have written not far short of 1,000 letters and circulars, how naturally anxious I was to economise time, and that it was which led to the circular being sent, as described, with the names of the architects and quantity surveyors omitted, for which omission one is more sorry than

SAMUEL STEAD,

Borough Surveyor.

Mr. Baggalay, one of the architects to the new baths, has already written to us to say that he thinks we have done Mr. Stead an injustice. The other hand we received a very decided expressed letter, from a person who from his position ought to have been well-informed, complaining that the Borough Surveyor was putting himself forward in every possible way in the matter, pointing the position of his name on the list of tenders as an example of it, and calling upon us to oppose this assertion on the part of the Borough Surveyor. I fear, have been some motive in this letter which did not appear on the surface, but the fact remains that the tender lists are invariably headed in our columns with the architect's name, sometimes that of the quantity surveyor being added, and that this tender was sent with the name of the Borough Surveyor, who was neither Mr. Stead's remarks about ourselves ridiculous, and merely show that he is utterly at sea as to the conditions under which a paper is carried on. Does he really imagine that the responsible editor of a paper sees personally all the "copy" for such things as tenders and news paragraphs? and is he really aware that the advertisements in a large journal are entirely under the management of the publisher, so that it is no part of the editor's duty to see them all? If we have done Mr. Stead injustice as to intentions we are sorry for it, but he admits that he sent the tender up to us in an improper form, and should have sent it up in the proper form, and the would then have been no misunderstanding.—ED.

### NONSUCH PALACE.

SIR,—In a cottage on the road from Ewell, Epsom, there is an old carved doorway built into inner wall. A man who inhabited the place told me that it came from Nonsuch, and that there were many minor specimens in the houses and cottages in that neighbourhood.

If this local tradition be true, the old palace might not be so hopelessly lost as "H. W. B." thinks.

It is not also seen in the background of some of the pictures at Hampton Court Palace? D. W.

### TRADE MARKS IN GREECE.

SIR,—According to advice just received from Athens, I learn that the Greek Government has decided to permit British subjects to enjoy the legal privileges for the protection of trade marks in accordance with "the most favoured nation" clause in Art. 10 of the Treaty between Great Britain and Greece. The new law requires the proof of British registration shall be produced when seeking registration in Greece. Various other formalities must be carried out, particulars of which I shall be happy to supply to any interested parties.

ROBERT W. BARKER, F.I.Inst., F.S.P.A.,  
British Trade Protection Office,  
Monument Chambers, London, E.C.

### HOT WATER HEATING.

SIR,—Mr. R. J. Macbeth's letter in your last issue contains a good suggestion; much difference of opinion exists in the Midlands respecting high or low pressure hot water heating. In the United States steam is the popular system. I am at present in favour of low pressure; it is simple, safe, durable and effective; if a good boiler is used with a rapid circulation, and enough piping or radiating surface it is perfect, and it requires no attention worth mentioning.

But if anyone can show me that high pressure is the best, I am desirous of listening to him; and Mr. R. J. Macbeth, would be very glad to have the matter discussed.

With a boiler that will make the water hot, plenty of radiating surface (either pipes, coils, or radiators) and especially under windows to prevent down draught, rapid circulation, which experience shows how to obtain; plenty of air-taps (which are better than open-pipes); then low pressure is the best, although its action may be, at starting the fire, slower than high pressure.

A. P. JEVON.

"STAINED GLASS AND DESIGNING."—In reference to the recent correspondence on this subject, Mr. Medland Taylor writes again that he did not say and could not have said, that the architect who he criticised and revised a design had a claim to be considered the designer, as he never thought so. That was however the impression left on our minds by a former letter from him to us, and as number 1 had a copy of the letter, it remains a question between his memory and ours.



## The Student's Column.

## THE STRUCTURE AND PHYSICAL PROPERTIES OF BUILDING STONES.—V.

## SPECIFIC GRAVITY.

THE terms 'specific gravity' and 'density' are used by many as though they were synonymous in meaning; but this is not the case. If we conceive a portion of matter to be divided into any number of parts having equal volumes, then if the masses of these parts are equal, in whatever way the division be conceived, taking place, that body is one of uniform density.\* The density of such a body is the mass of the unit of volume. If now we take the density of distilled water at 4° C. to be unity, the relative density of any other substance is the ratio which the mass of any given volume of that substance, at that temperature, bears to the mass of an equal volume of water. The relative density of a substance is called its *specific gravity*.

To calculate the specific gravity of a body it is sufficient to determine its weight and that of an equal volume of water, and then to divide the weight by the volume. The methods of determining this are very numerous, but we need only refer to those adopted in estimating the relative density of building stones.

(a) In one method the observers have experimented with cut and ground cubes of stone, each of which was carefully measured so that its cubical contents could be calculated. Its weight is then ascertained, and compared with the weight of an equal volume of water at the standard temperature, as above alluded to.

(b) In another method, the specimens dealt with were roughly-cut samples of stone, approximately cubical. Having been allowed to dry for doors, they were then weighed and subsequently immersed in water for some hours, so that they might absorb as much as possible. They were then weighed in water, suspended by a thread from the analytical balance used. The weight in air is divided by the loss of weight in water, and the result taken as the specific gravity.

(c) In a third method, the samples operated upon were dried at a constant temperature, weighed, and then immersed in cold water, weighed, and freed from air by boiling. The vessel containing the specimens was placed on the receiver of an air-pump, and a partial exhaustion of the air of the receiver allowed the water to completely saturate the stones. They were then weighed in water, and the specific gravity computed in the usual manner.

(d) In a fourth method, the relative density of the particles composing the stone has been ascertained either by (1) crushing the specimens to powder and obtaining the result by means of the "specific gravity bottle"; or (2) by assuming that the water absorbed during immersion when atmospheric pressure is removed completely, places the air which previously occupied the voids.

We have given the foregoing particulars as to the methods adopted in determining the specific gravity of building stones, in order that the reader may fully comprehend the manner in which an exceedingly simple principle in physics has been variously interpreted; and also to point to some measure for divergent published results of the specific gravity of one and the same material. The question is full of interest to the architect, as we shall presently attempt to show. We have before us copies of two reports drawn up respectively by two well-known analytical chemists, in each of which the specific gravity of a particular stone is stated, but with very different results. In the first it is stated to be 2.22, whilst in the other it is 2.45. In an official report on the same stone its specific gravity is quoted as 2.6 and 2.64. And the case we have chosen for illustration is by no means an isolated example. The range in regard to the specific gravity of any well-known building stone is equally as wide, and under the whole subject with feelings akin to just. We were about to say that the majority of the published results of relative densities are of use whatever, until we remembered that they are, to some extent, serve the ends of a certain class of stone agents who rejoice in quoting the best results on their opponents' stones, and the highest in regard to their own, and *vice versa* where light stone is required.

The cause of the widely-divergent results is not

difficult to understand on a careful consideration of the methods, already detailed, by which the specific gravities of building stones have been ascertained. We have seen that in some instances the results were calculated on comparing (1) the dry weight with that of an equivalent volume of water, and (2) the dry weight with that of a saturated sample in water. In the first, the amount of water absorbed by the sample is not taken into account, whilst in the second it is. Clearly either one or other of these methods is wrong. Which is right? We do not hesitate to say that the first-mentioned is the accurate one, for, as we have seen, an elementary principle in physics lays down the law that the relative density of a body is its weight compared with the weight of the volume of water displaced by that body during immersion. If, therefore, the body is allowed to absorb water during immersion the results must perforce be inaccurate.

We admit that it is not easy to prevent porous stones from taking up water during an immersion experiment; the method commonly adopted by the physicist is to varnish them, by which process they are rendered practically impervious without altering their volume. Another way is to have the samples cut in cubes, as previously described (method a), which is unquestionably the best means of arriving at the result when the cubes are really perfect so that their cubical contents can be accurately calculated; but when the contents have to be estimated, by reason of the cubes not being quite regular (which is most frequently the case) an uncertain element is immediately introduced.

The method adopted in our experiments differs from any of the preceding, and may be briefly described as follows:—All the samples were squarely cut  $1\frac{1}{2}$  in.  $\times$  1 in.  $\times$   $\frac{1}{2}$  in., as nearly as may be. Before being weighed in a chemist's balance they were placed in a room for some weeks to get rid of quarry water. They were then placed in shallow pans and immersed in water in the same manner as in the absorption tests detailed in our last article, and allowed to stand therein for one week, or until fully saturated. On being taken out of the water each sample was suspended by thin cotton thread from one of the scales of the balance, submerged in water, and reweighed. The weight of the dry sample was divided by the difference between it and the weight when immersed. Now, the product thus obtained is not the specific gravity of the stone; it is to all intents and purposes the relative density of the particles composing it, which is a different thing. Practically the same result may be obtained by pulverising the material and using the specific gravity bottle. In arriving at the true specific gravity of the stone we have deducted the amount of water absorbed, from the weight of the sample in water, and the difference between the product and the dry weight was used for dividing the latter, the result being the specific gravity. Thus, supposing 412 grains = weight in air of a Coombe Down Bath stone; 254 grains = its weight (after absorption) in water; and 37 grains the amount of water it absorbed. Then  $254 - 37 = 217$  grains.  $412 \div 217 = 1.95$  grains.  $412 \div 195 = 2.11$  specific gravity.

From the above it will be gleaned that it is our intention to give two results on each stone, viz.:—(1) Its specific gravity as a whole; and (2) the specific gravity of its component parts as deduced from the absorption experiments.

What practical value has the specific gravity of building stone to an architect? It has been taken as indicative of the relative strength of the material; but this cannot for one moment be admitted, although there is a slight approximation in regard to certain varieties of limestone. We hope to say something further respecting this when dealing with the experiments on strength. Professors Daniell and Wheatstone in their report to the Commissioners on stone for building the Houses of Parliament (1839) stated (p. 36) that "the specimen which has the greatest specific gravity possesses the greatest cohesive strength, absorbs the least quantity of water, and disintegrates the least by the process which imitates the effects of weather"—all of which we beg to question in the light of more recent researches.

The principal value of the specific gravity experiments to architects is to enable them to calculate the weight of stone to be put into their buildings. The weight as given at the quarry is usually incorrect, for many reasons, commercial and otherwise, though blame is not always to be attached to the quarry-owners, on this head. To arrive at the weight of a cubic foot of stone, it is only necessary to multiply its specific gravity by

62.42 lbs.—the weight of a cubic foot of water. Thus, taking the specific gravity of the Bath stone alluded to,  $2.11 \times 62.42 = 131.7$  lbs., the weight of a cubic foot of the stone.

We have seen that some observers have computed specific gravity from specimens saturated with water. If we had adopted that method (which is based on an erroneous conception of specific gravity), the following would have resulted from the same sample of Bath stone referred to. Its specific gravity, instead of being 2.11, would be 2.61. Therefore,  $2.61 \times 62.42 = 162.9$  lbs. weight per cubic foot. The difference in the relative weights would be  $162.9 - 131.7 = 31.2$  lbs. An architect basing his calculations of weight of structure on this erroneous method would obtain a correspondingly bad result.

On the other hand, we must remember that the weight calculated from the true specific gravity is the dry weight only of the stone; and we know that in practice a building stone is hardly ever dry. In the Bath stone referred to, then, 131.7 lbs. per cubic foot is the minimum weight. This particular sample absorbed 9.09 per cent. of its dry weight of water during the absorption experiments. If we desire to know the maximum weight of the stone we must therefore add this amount, which in round numbers is 12 lbs. to the minimum weight— $131.7 + 12 = 143.7$  lbs. But we have remarked that when built up, a stone never absorbs its full complement of moisture. When in the structure it would weigh about 137 lbs. per cubic foot, though this would naturally vary in dry and wet seasons.

In marine works, the greater the relative density of the stone used, other things being equal, the more suitable it is for the purpose.

Specific gravity is sometimes quoted in connexion with road metal, as an index of its quality; we cannot discuss this point now, suffice it to say it is of no use whatever in that respect.

## OBITUARY.

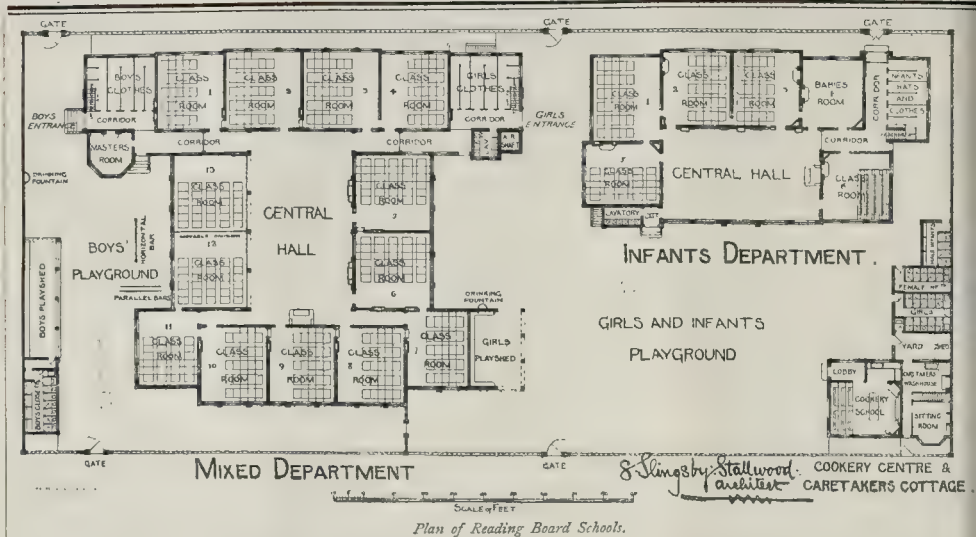
MR. HENRY BOWES SCOTT.—We have learnt with regret of the decease of Mr. Henry Bowes Scott, widely known as a partner in the firms of Bowes Scott & Read and Bowes Scott and Western. He was a son of the late Major-General Scott, C.B., R.E., F.R.S., the well-known designer of the Royal Albert Hall, and devoted his life to engineering pursuits. He was not only well-known as an authority in sanitary engineering, but was practically one of the first pioneers of electric lighting, although he subsequently became mainly identified with mechanical engineering. Mr. Bowes Scott was to a great extent instrumental in introducing Rogers Field's Automatic System to public notice, by means of which the health of the larger centres of population was much improved, and his genial and popular presence will be widely missed in engineering circles. He married in 1879 a daughter of the late Colonel Sir Hugh Owen, Bart., A.D.C. to the Queen, and leaves a son and two daughters.

## GENERAL BUILDING NEWS.

HIGHER GRADE SCHOOL, WOLVERHAMPTON. On the 16th ult. Professor Jebb, M.P., opened a new higher grade school, situated on the New Hampton-road, Wolverhampton. The main front faces the New Hampton-road, being two stories high, and is designed in the Renaissance style; the façade is broken up by gables. The materials used are red-pressed bricks and terra-cotta, with green slates for the roof, the boys', or main entrance, being placed between the main block and the wing devoted to a technical department. The return elevation on the east side is carried out to harmonise with the main front, and faces the new street now in course of construction. Accommodation is provided for 372 boys and 252 girls. This is exclusive of the cookery and technical department. The boys are placed on the ground floor, the plan consisting of large central hall, surrounded by six class-rooms opening direct out of the same. The size of this hall is 67 ft. by 34 ft., and 29 ft. high to the tie-beam and 44 ft. to the ridge, the roof being open timbered. It has a gallery 5 ft. 6 in. wide all round at first floor level. To the left of the boys' entrance is the technical wing, consisting of lecture theatre, with preparation room, &c., in connexion. The remaining space on the ground floor is taken up with head-master's room, assistant teachers' room, hat and cloak rooms, lavatory, book stores, staircases, and lifts. The girls are placed on the first floor, the class-rooms coming over those of the first floor, and opening on to the gallery round the central hall. The cookery room with scullery and stores are at the rear of the building. The chemical laboratory is placed in the wing over the lecture theatre and preparation room; adjoining this is the physical laboratory and art room. The remaining space is devoted to head-mistress's room, assistant teachers' room, cloak rooms, lavatory, book stores, staircases, and lifts. The boys enter from the New Hampton-road, and

\* Ganot's "Physics" 9th ed. (1879), p. 11.





Plan of Reading Board Schools.

the girls from the new street on the east side. Two stone staircases are provided, one to each entrance, that to the boys' entrance being available for the technical section. Open and covered asphalted playgrounds are provided; in the boys' playground are two workshops, each 25 ft. by 16 ft. The building is warmed throughout with hot water on the low pressure system, with radiators, carried out by Mr. J. Attwood, of Stourbridge, besides which all the rooms have open fireplaces. Internally the walls are finished to a height of 4 ft. with a painted wood dado, above which they are plastered and coloured. The wrought-iron gates and railings were supplied by Brawn & Co., of Birmingham; the terra-cotta by Dennis, of Ruabon; the wrought-iron gas-fittings by Winfield, Limited, of Birmingham. The general contract for the erection of these schools was placed in the hands of Mr. H. Lovatt, of Wolverhampton. The cost has been about 12,000*l.*

**DEAF AND DUMB INSTITUTE, GLASGOW.**—A new Deaf and Dumb Institute for Glasgow is being erected at the corner of West Renfield-street and West Campbell-street. The new institute, of which Mr. Robert Duncan, of Glasgow, is the architect, is estimated to cost 6,000*l.* Polished red freestone is being used, and the style of architecture is Italian. The structure is three stories in height. There are four flats, one being below the street level. Two work and reception rooms, kitchen, and heating-chamber occupy the basement, and on the street floor is a large central hall, to which access is had from the main entrance in West Regent-street. Leading off this hall are the office of the secretary, reception-room, large reading-room, library, billiard-room, a gymnasium, chess and bath room. The second floor, reached by the main staircase from the entrance vestibule, is entirely occupied by a hall, which accommodates some 500 people. Attics complete the building, and sleeping rooms are to be provided here for casual visitors in quest of employment.

**ALTERATIONS, FALKIRK POORHOUSE, STIRLING-SHIRE.**—On the 29th ult. Falkirk Poorhouse was re-opened after alterations and improvements. The work has been carried out from plans prepared by Messrs. A. & W. Black, architects, Falkirk, and embraces the following additions and improvements:—The erection of a boys' day-room, 20 ft. by 28½ ft.; the addition of a corridor along the whole length of the back of the building, giving access to all parts; and the erection of bath-room and lavatory accommodation in direct communication with all the wards in the three flats of the building. The flooring throughout the house has also been re-laid, and all the walls of the various wards repainted. The detached building which was formerly used as an asylum in connexion with the house has been converted into wash-houses, laundry, and workshops, while in connexion with the porter's lodge at the entrance gate a bath-room has been erected having communication with the probationary wards.

**MASONIC BUILDINGS, PONTEFRAC.**—A few days since the foundation-stone was laid of new Masonic buildings which are being erected in Ropergate, Pontefract. The buildings will be of red brick, with terra-cotta panelling and stone facings. There will be a caretaker's house adjoining, the whole work

costing 1,000*l.*, apart from the price of the site. Mr. J. H. Greaves, is the architect.

**BOARD SCHOOLS, READING, BERKS.**—The new Board Schools recently erected for the Reading Board and to be known as "Battle" Schools have just been opened. They have class-room accommodation for 1,136 children, with a cookery centre and caretaker's residence. The buildings are all of one story in three separate detached blocks. The main block is the mixed school for 768 boys and girls. The second block is for 354 infants, and the remaining block consists of the cookery school and caretaker's house combined. The arrangements of plan are on the class-room system with central halls, the mixed-school having thirteen class-rooms and the infants' school six. The buildings are faced externally with Higgs & Sons' hand-made red bricks with strings and other features carried out in special moulded brick. A feature in the centre of the group is a campanile which serves as a ventilating shaft communicating with underground passages and culverts through which the vitiated air is drawn from the several rooms and halls by means of a propeller worked by a gas-engine, and a constant circulation of fresh air is thus secured. The heating is in terms of hot-water ventilating radiators and coils. All the windows are fitted with Leggett's gear for summer ventilation; the floors are of pitch pine blocks laid by "The Wood Block Flooring Company." The whole of the play-grounds are paved with "Granitic" paving throughout. The builders are Messrs. Higgs & Sons of Reading; the hot-water heating is by Mr. E. Oldroyd of Leeds; the wrought-iron fencing (of which there is a considerable quantity) is by Messrs. Hill & Smith of Brierley Hill; Mr. R. Pratt was clerk of works, and the architect is Mr. S. Shingby-Stallwood, F.S.A., of Reading.

**SCHOOL BUILDINGS, ST. STEPHEN'S-IN-BRANWELL.**—A new school has just been completed at Whittemoor for St. Stephen's-in-Branswell School Board, Cornwall. Accommodation in the school includes a main room 50 ft. by 18 ft., class-room 18 ft. by 16 ft., and infants' 36 ft. by 16 ft., and is for about 200 children. Lobbies having entrances therefrom to each room and cloak-rooms are included, the latter being fitted with lavatory basins. All the school and class-room floors are laid with wood blocks, the cloak-rooms and lobbies with tiles. The plans were prepared and the work superintended by Mr. Hill, architect, Redruth, and the contract was let to Mr. Watters, of St. Stephen's, for the carpentry, and Mr. Gilbert, of Trillick, for the masonry.

**BOARD SCHOOLS, LONGPORT, STAFFORDSHIRE.**—New Board Schools have just been opened at Longport. The premises form an extension to the building which has been for some years used as an infants' school. The architect is Mr. A. R. Wood, of Tunstall. The materials employed are principally red brick with terra-cotta embellishments. The contractor for the building was Mr. W. Grant, of Burslem, whose tender was 4,520*l.* The Sneyd Colliery Company supplied the glazed bricks used in the decoration of the interior, Messrs. Trussell & Son the heating apparatus, and Mr. Eardley has executed the plumbing and glazing.

**BOARD SCHOOL, OLDHAM.**—A new Board School was opened on the 27th ult. at Oldham. The school consists of two separate blocks of buildings one story high—an infant department and a mixed department—the former building being placed at the north-west end of the site, and the latter at the opposite end. Separate playgrounds are obtained

for boys, and for girls and infants, with entrance from both Coppice-street and Fern-street. The total accommodation is for 1,010 children. The infant school consists of a central hall 36 ft. by 50 ft., accommodating 90 children, with five class-rooms arranged on two sides each room providing for 60 children, the total number of infants provided for being 300. A marching corridor, with lavatory and cloakroom and teachers' rooms placed on one side, gives access to the central hall. The mixed school contains a central hall, 46 ft. 9 in. wide by 80 ft. long, lighted by a continuous lantern and by dormer windows, and accommodates a class of six children. Nine class-rooms are grouped around the hall, with direct access therefrom. Two of the rooms accommodate seventy scholars each, all seven provide for sixty each, being a total accommodation for 620 mixed scholars. Provision is made for extension by two class-rooms accommodating eighty scholars each. A gymnasium, 45 ft. by 26 ft. 9 in., is arranged between the corridors, giving separate access thereto for each sex. A cookery room, 27 ft. 4 in. by 22 ft. 6 in., with scullery, provided, also with access from the girls' corridor. Advantage has been taken of the fall in the level of the site to obtain in a semi-basement a manual instruction room for the boys and a similar room for the teaching of laundry work to the girls. Rooms for the principal and assistant teachers are obtained on either side of and over the entrance. A tower surmounts the boys' entrance. A caretaker's residence is also provided in a separate building at the north-west end of the site. The buildings are built of Messrs. Platt's bricks with Yorkshire stone dressings. The roofs are covered with slates, and the whole of the floors of the halls and class-rooms are formed with wood blocks on concrete. The entrances and cloak rooms are paved with flags, and the internal walls of the halls and class-rooms are finished with pitch pine dadoes and plastered walls. The internal walls of the entrances, gymnasium &c., have glazed brick dadoes. The playgrounds are paved with asphalt, and the site is surrounded by walls and wrought iron railings. The general contractor is Mr. Emanuel Whittaker, of Oldham; Mr. W. F. Spencer, of Crossbank Works, Oldham, has executed the hot-water heating; Messrs. Pot & Co., of Leeds, have supplied the clock; the clerk of works is Mr. W. R. Norris, and the architect is Mr. G. E. T. Laurence, of London. The school has cost 15,000*l.*

#### SANITARY AND ENGINEERING NEWS.

**ELECTRIC LIGHT AT THE LONDON SCHOOL BOARD OFFICES.**—The plant for this light, which in the basement of the new building consists of two Babcock-Wilcox water-tube boilers, designed to work at a pressure of 150 lbs. per square inch, which supply steam to a pair of Parson's steam turbines and dynamos of the radial flow type, each capable of supplying 32,000 watts. Arrangements are provided whereby, when the steam has done its work in the engines, it is utilised for heating the hot-water service throughout the building, and also for warming the building itself. This is effected in the following manner:—From the engines the exhaust-pipe is led to three feed water heaters, arranged parallel and each fitted with valve and by-pass so that the amount of steam passing through each or all of the



be regulated. One of these heaters is employed to heat the feed water to the boilers, the other two in connexion with the hot-water service for theatories, &c. After passing through the heaters, exhaust steam is conveyed along a pipe which is connected with the radiators throughout the building, and also with an exhaust pipe that is carried to the top of the edifice. An automatic back pressure valve is so arranged that when the heating of the building is desired a constant back pressure that can be adjusted from 2 up to 10 lbs. is maintained on the engines and on the radiator service, the remaining steam, if any, passing the valve and escaping to the air. In order to provide for the heating of the building and of the water-service at such times as the engines are not running, there is further a connexion with a steam-reducing valve which automatically admits live steam from the boilers to the exhaust pipe between the engines and the heaters when the supply of steam to the engines is shut off. When the radiators are in the greater portion of the steam used for the engines is condensed in the radiators and returned to a receiver, from which it is pumped into the boilers again. As the engines are not internally lubricated, there is no oil or grease in the exhaust steam to cause trouble in the boilers. In this inner both the lighting and the heating of the building are economically effected. In addition to the engine and boiler spaces there is an accumulator room in which there is a battery of storage cells for supplying light at such times as it is not convenient to run the engines. Now that public electric supply companies exist practically all over London, it is assumed that it is necessarily more economical to obtain electricity from such a supply rather than to manufacture it on the premises for any particular building. This is no doubt true in the case of all small installations, but where, as at the School of Hard Offices, there are upwards of 1,000 lights, and here, in addition, the exhaust steam from the engines can be utilised for heating, which would in any case require boilers and attendance, a private plant is frequently the most economical arrangement.

**THE RECONSTRUCTION OF THE NORTH BRIDGE, EDINBURGH.**—At a meeting of a sub-committee of the Lord Provost's Committee of the Edinburgh Town Council on the 25th ult., 10 plans were submitted on behalf of the North British Railway Company for the reconstruction of the North Bridge. Mr. Hall Blyth, C.E., presided at the meeting in the interests of the Railway Company, and Sir William Arrol and Mr. Hunter, the law agent of the city, were present to advise the Corporation. The plans submitted showed a design for a hotel at the south-east end of Princes-street, extending backwards to the new buildings, as far as the tramway company's offices, and carrying away the premises of Messrs. Cranston & Co. and the adjoining buildings on the North Bridge. The new bridge would cover the railway area in two spans, with a third and shorter span carrying it over Jeffrey-street, while the railway lines between the North Bridge and the Waverley Bridge would be covered with glass. In the course of conversation it transpired that while the railway company were still willing to contribute 30,000l. towards the reconstruction of the bridge, Sir William Arrol estimated that the bridge would cost 100,000l. It was suggested that although the railway company did not seem willing to pay a sum based on the proportional cost of the bridge, it might be arranged that the company should undertake the building of the bridge, and that the city should limit their contribution to 60,000l. The question of widening the North Bridge was afterwards considered, along with estimates of the cost by Messrs. Cousin & Mison, architects, and Mr. Laing, City Assessor.

MAINTAINED GLASS AND DECORATION.

**ECCLESIASTICAL PAINTING, CAMBRIDGE.**—One of the largest ecclesiastical paintings in England is just being completed in the new church of the English Martyrs at Cambridge. It occupies the whole of the space over the eastern arch of the tower, about 23 ft. by 20 ft., and contains about a hundred figures and portions of figures, the largest being about 10 ft. high. The subject is the glorification of the "English martyrs" (according to the Romish calendar, *parently*), and the composition is divided into three *quasi* tiers. The upper tier contains a host of angels with the instruments of the Passion and Resurrection. In the centre below is a large figure of Our Lord, and on either side are the Virgin, St. John Baptist, and the twelve Apostles. In the lowest tier there are large figures of St. Thomas of Canterbury, and St. Alban, with smaller ones of other canonised martyrs. The whole is painted in oil on canvas, which has a much better effect in oil-painting, and does not discolour like fresco. The work was composed and painted by Mr. N. H. J. Westlake, F.S.A.

FOREIGN AND COLONIAL.

**FRANCE.**—MM. Thiebaut, *frères*, have just completed the casting in bronze of an allegorical figure, "La Ceramique," the work of M. Guillaume, which is intended for the decoration of the national manu-

factory of Sèvres. —The Duc d'Anmale has commissioned from MM. Olivier Merson and Olivier de Penne, for the Château at Chantilly, some large decorative panels having for their subjects, "Les Fêtes et les Chasses de la Maison de Condé," from the seventeenth century to the time of Louis Philippe. —The "Société des Amis des Arts" at Nîmes is to inaugurate in May an exhibition in the Gallery of Arts, generously presented by M. Jules Salles, Vice-President of the Society, to his native town. —The construction of some large barracks at Beauvais is talked of. —The Chamber of Deputies has taken into consideration a proposal of the Deputy of the Seine, M. Jacques, to declare as a scheme of "utilité publique" the making of a maritime canal between Paris and Rouen. —The Municipality of Nevers has opened a competition for the construction of two covered markets, to be called those of St. Martin and Sainte Agile. —M. Bourdelle, the sculptor, has completed the monument raised by subscription to the memory of Léon Cladel, the novelist. The monument, to be erected at Montauban, will be inaugurated in June. —We have to record the death of M. Georges Herscher, of the house of Geneste and Herscher, vice-president of the Société des Ingénieurs Civils and a member of the Chamber of Commerce. He was at first known in connexion with the science of warming and ventilation, and subsequently devoted himself to questions of public hygiene. He contributed largely towards the better sanitation of towns and dwellings, and his works on these subjects are standard books of reference. —Some large exterior buildings are to be constructed at Marseilles, partly in order to give more roadway for getting away from the docks and the crowded centre of the town. —There is a proposal to bring to Lyons the waters of the Lake of Annecy. This scheme, the cost of which would amount to some million francs, offers an opportunity for greatly improving the sanitary condition of the city. —It is announced that the Government has decided on the future site for storage of the decorations of the Opera Comique and the Paris Opera, which will be installed in barracks No. 49 on the Boulevard Berthier, near the Porte d'Asnières. This storehouse will be large enough to hold also the decorations of the Odéon.

**INSANITARY CONDITION OF BOMBAY, CALCUTTA, AND MADRAS.**—According to the annual report on sanitary measures in India, recently laid before Parliament, although good progress continued to be made with sanitary work in Bombay, parts of the town are very unhealthy. The death rate averaged 29.9, ranging from 24 in the water division to 44.41 per thousand in the Kamathipura division, inhabited to a large extent by the poorest of the population. The chief causes of disease are imperfect house drainage, ventilation, and the prevalence of overcrowding, the locality being densely populated. The place, which was in former days a swamp, has been filled up with city refuse, and the people live over this decomposing soil. In some of the other quarters there are formidable evils to be dealt with. In Byculla there is "still sewage in ditches and lanes." In Second Nagpada overcrowding is the principal defect. In Parel there are pools of sewage amidst dwellings, polluting air and ground, and oozing to lower levels, often beneath dwellings. In spite of all the improvements effected during recent years, the sanitary condition of Calcutta is still bad. The death rate of 1891, 27.9, ranging by wards from 14.9 to 45.4 per 1,000, was higher than that of 1882 or any of the intervening years. Many parts of the town are as insanitary as they well can be. One great defect is the want of fresh air in the badly-ventilated quarters. It is considered that this can be remedied by demolition accompanied by the creation and enforcement of proper building laws and regulations, there not being any at present. Another is that the older sewers, when flooded, pollute the soil and subsoil water through leakage, and send forth, through their open manholes, offensive gases into the atmosphere. A third great defect is that, while an abundant supply of water is pumped into the town, owing to the supply being intermittent and also to the insufficient supply of stand pipes inside the bustees, the inhabitants are in much the same position as before the extension of the supply, and either obtain water from stand pipes at a distance, store a supply in vessels, or resort to their tanks and wells. —In view of the many and grave sanitary defects under which the town of Madras labours, it is disappointing that no progress in the work of improvement has not been effected. The year was signalised by a very heavy mortality averaging 52.6, and ranging from 43.3 to 72.8 per thousand in the various divisions. Among the causes of this high mortality are: defective drainage, and in a considerable part of the town no drainage system at all; a porous soil loaded with organic impurity; a putrid and fluctuating subsoil water rising comparatively near the surface; an inefficient water-supply; want of open spaces; crowded *pacherries* for the poor; overcrowded and ill-ventilated houses for the middle classes, in many cases directly connected with the subsoil water by wells in their interior; burial grounds and slaughter-houses in the town. Matters which can only be remedied by a heavy expenditure of money and years of patient and systematic work.

MISCELLANEOUS.

**SIR BENJAMIN BAKER ON TECHNICAL EDUCATION.**—At the Queen's Hall of the People's Palace, Mile-end-road, on the 24th ult., Sir Benjamin Baker, K.C.M.G., F.R.S., distributed the certificates to the evening class students. The Master of the Worshipful Company of Drapers (Sir John H. Johnson) presided. The classes, which with some exceptions, are open to both sexes, without limit of age, are conducted with a view to giving students a practical and theoretical knowledge of the various trades and sciences, and to prepare them for the examinations of the Science and Art Department, the City and Guilds of London Institute, and of the Society of Arts. At the end of each session examinations are held and trade certificates awarded for the purpose of assisting students to obtain situations. The Chairman said that for some time Sir Benjamin Baker had been an invaluable member of the General Purposes Committee of the Governors of the People's Palace, and he had undertaken the principal part in the examination of the engineering classes. Sir Benjamin Baker said that the present was the first time that trade certificates had been given by the Governors of the People's Palace. He had no claim to their attention except as a technical student, which he had been all his life, and which he must be until the end of his career, unless he wished to lag behind in the progress of mankind. When he looked back at his own early days, he could not but envy the advantages students of the present day possessed. The first step to the attainment of knowledge was the recognition of one's own ignorance. The nation which neglected the proper education of its people in the sciences, arts, and manufactures must be content to occupy a secondary position. It was easy enough now to see how blind our predecessors had been on the subject of technical instruction, but so much remained to be done that he expected our descendants would express equal surprise at the slowness of their predecessors. Although our progress had been great, thanks to the liberality of the City Companies, he doubted whether we had succeeded in holding our relative position as regarded America, though he believed we had done so as regarded Germany and France. Technical education was in many respects now in the experimental stage, and no one could tell what would be the outcome of the present position, though it was impossible to doubt that it could be anything but good. It was necessary for students and teachers alike to remember that a certain amount of scientific and theoretical knowledge in the future must be considered as an indispensable element of success in the great battle of life. Success would depend upon their choosing the right field of labour in the first instance, and upon their boldly facing the difficulties which were sure to arise.

**ROYAL CAMBRIAN ACADEMY OF ART.**—The annual meeting of members and associates was held on the 27th ult., at Plas Mawr, Conway. Mr. H. Clarence White, R.W.S., was re-elected President. Mr. Cuthbert C. Grundy, F.S.A., was re-elected vice-president, Mr. G. Swinford Wood and Mr. J. Pain Davies being appointed to the respective offices of honorary treasurer and secretary. The following artists were elected on the Council:—Messrs. George Cockram, J. H. Cole, B. Fisher, B. Fowler, P. Ghent, Anderson Hague, R. G. Harrison, Leonard Hughes, J. Johnson, J. A. Johnston Jones, Joseph Knight, A. F. Perrin, Charles Potter, J. C. Salmon, and W. Slater. Mr. John Finnie was elected a full member, and Messrs. S. Sidley, R.B.A., Arthur Baker, F.R.I.B.A., and G. Sheridan Knowles, R.I., were elected full members from the list of Associates. Messrs. Harold Hughes, A.R.I.B.A., Paul Knight, G. Hall Neale, Oliver Baker, and Reginald Smith were elected associates of the Academy out of a long list of candidates. The receiving days for the exhibition of 1894 were fixed for April 27 and 28; press day, May 9; private view, May 12; the Academy being opened to the public on May 14. Messrs. B. Fisher, B. Fowler, P. Ghent, and Anderson Hague, R.I., were appointed the Hanging Committee, and Messrs. W. J. Slater and B. Fowler were elected honorary auditors. Messrs. Arthur Baker and Harold Hughes have the care of Plas Mawr, Conway, the House of the Royal Cambrian Academy, where the annual exhibitions are held.

**LEEDS BUILDERS' EXCHANGE.**—The second annual meeting of the Leeds Builders' Exchange was held on the 23rd ult. in the Club-rooms, 19, Boar-lane, Leeds. The report and balance-sheet were read by the secretary, Mr. G. F. Wilkinson. The former detailed the successive steps by which the Builders' Exchange became a permanent institution, and blossomed into a social club, and then went on to describe the work it had done in connection with the Leeds Consolidation Bill on points which were considered detrimental to the interests of the building fraternity. Especial prominence was given to the proposed clause prohibiting the building of back-to-back houses, and in this connexion it was stated that the committee visited Hull at their own cost, in consequence of the laudation of the through houses for the working classes there, but that their careful inspection of these resulted in a conviction that the system prevailing in Leeds was in every way superior to the houses they saw in Hull. So far as the club was concerned, and in the promotion of which the executive freely acknow-





ing the passage of the grit used in operating upon  
—PAINT: *J. W. Overton*.—The paint which is the  
of this patent is composed principally of the mineral  
as "rutile," a dioxide of titanium, ground, and  
ith coal-tar or bituminous compound.

—DOOR BOLTS: *E. Gordon*.—To provide a catch  
to the houseplate is affixed a catch-piece  
fitted plane. When the bolt is "shot," the catch  
by the bolt acting upon the inclined plane, which  
s and locks the bolt. A thumb-piece is provided to  
catch when it is desired to release the bolt.

NEW PATENTS FOR LETTERS PATENT.

ARY 15, 884, W. Woolrich, Method of Putting  
any number of Blocks of Pine or Lime or other  
to form Cutting-boards, &c.—884, A. Brown, Tool or Auger  
to G. G. Bell, Reciprocating Machine  
Holmstrom, Preventing the Freezing of Water in  
and Cisterns.—889, E. Hutchins, Ventilating Appar-  
Window-sashes.—898, A. Brown, Tool or Auger  
to G. G. Bell, Reciprocating Machine  
Judging and Dressing Stone used for Building,  
16, &c.

ARY 16, 921, F. Ballard, Burning Bricks in an  
ick Kiln.—921, F. Ballard, Utilising the Heat given  
a Brick-burning Kiln.—942, J. Stow, Door and  
imilar Bolts, &c.; J. Chevalier, Jaws for Cutting  
and similar substance.

ARY 17, 1001, J. Clark, Rain-water Channels.—  
Hancock, Syphons for Cisterns for Water-closets.—  
J. Chapman, Joiners' Ratchet and other Braces.—  
B. Blackbeck, Collapsible Doors.—1075, G. Brasse,  
to G. G. Bell, Reciprocating Machine  
Judging and Dressing Stone used for Building,  
16, &c.

ARY 18, 1095, J. Gutemann, Fasteners for  
and other Sliding Frames.—1126, J. Moseley,  
for Walls, Ceilings, &c.—1127, F. Smith, Braces  
to G. G. Bell, Reciprocating Machine  
Judging and Dressing Stone used for Building,  
16, &c.

ARY 19, 1107, A. Steves, Apparatus to Prevent  
of Kitchen and other Circulating Hot-water  
—1175, T. Cowell, Screw-drivers.—1176, T. Joyce,  
to G. G. Bell, Reciprocating Machine  
Judging and Dressing Stone used for Building,  
16, &c.

ARY 20, 1213, T. Clark, Coach Painting and  
in general, &c.—1214, A. Luchinon, Discharge  
Water Valve for Baths, Tanks, &c.—1215, C. Ellis,  
for Ventilating Buildings, Sewers, &c.—1294,  
ians, Door Handles or Knobs.—1304, W. Judd,  
ing Water-pipes Bursting from Frost.

PROVISIONAL SPECIFICATIONS ACCEPTED.

ARY 11, H. Burnett, Drain and Soil-pipe Testing Appa-  
ratus.—11, W. Monro, Spigot for Earthenware Fittings,  
pipes, &c.—21,226, S. Lincoln and J. Tindale,  
s for Windows.—24,380, W. Nicol, Window  
—24,511, H. Fuller and T. Wyatt, Weather Strip.  
S. Wilson, Fastener for Window-sashes, &c.—  
J. Young, Weather Bars for Casement Windows.  
A. Hall, Connecting Pipes.—24,813, F. Scruby and  
ler, Fireproof Wall and Ceiling Covering.—8, J. De-  
—25,037, T. Downie, Window-sashes.—8, J. De-  
Romenek's Ends, &c.—1, 614, 28, 490, 1, 330, 22,  
minney and Ventilating Shafts.—70, A. Rea-  
ding and Unfastening Window Leads.

COMPLETE SPECIFICATIONS ACCEPTED.

(Open to Opposition for Two Months.)  
W. Kinnerney, Combined Screw and Nail.—6,547,  
sen and W. Walker, Ventilators.—17,514, W. Smith,  
ing Timber Structures.—20,556, A. Mirza, Securing  
of Strong-rooms, Safes, &c.—22,949, T. Hilder,  
Rooting Tiles or Plates.

RECENT SALES OF PROPERTY:

ESTATE EXCHANGE REPORT.

ARY 24, H. Perkins and Co., 75, 77, 79, 81, Abbley-  
dsey, &c., 781, 790.—By *Furber, Price, &c.*,  
24, Craven-rd., Paddington, to 43 yrs., g.r. 104,  
1,350, &c., 6, Craven-rd., to 45 yrs., g.r. 104,  
1,350, &c., 14, Bishop-rd., to 47 yrs., g.r. 204,  
1,750.

ARY 25.—By *D. Watson & Sons*: A profit rental  
per annum, Holloway-rd., to 10 yrs., 500s.—By  
J. A. 21, 21, 21, 21, 21, 21, 21, 21, 21, 21, 21, 21,  
Buttress-st., &c., 7101, 6, Canon-pk., Whitechapel,  
L. 168, 300s.—By *Stimmon & Sons*: 23 and 25,  
le-rd., Brighton, to 20 yrs., g.r. 51, 28, &c., 561,  
218, Kennington-rd., Kennington, and 1 and 2,  
st., to 33 yrs., g.r. 904, &c., 1954, 470s., 50s.,  
e-rd., Walworth, to 49 yrs., g.r. 54, &c., 371, 10s.,  
e-rd., of 504, Wandsworth-rd., &c., to 25 yrs.,  
3 to 19, Thornett, Mitcham, to 86 yrs., g.r.  
1804.—By *Neelson & Co.*: 9, 12, and 15, Milton-  
thamston-rd., 450s.—By *Fairbrother, Ellis & Co.*:  
Kington Palace Gardens, Kensington, to 49 yrs.,  
58, &c., 750s., &c., of 304, St. John-st., Clerken-  
well, in 7 yrs., 2,800s.; &c., of 461, St. John-st.,  
version in 9 yrs., 2,950s.; "The Railway Tavern,"  
eal-rd., Limehouse, &c., 1, 1912, 2,500s.; 45s., 47,  
Romenek's Ends, &c., 1, 614, 28, 490, 1, 330, 22,  
Church-st., Bethnal Green, &c., 1, 1204, 1,950s.,  
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**WOTTON-UNDER-EDGE (Glas.)**—For the execution of water supply works, for the Durley Union Rural Sanitary Authority, Mr. A. P. I. Cotterell, C.E., Lonsdale Chambers, Baldwin-street, Bristol.

Beachim & Belmont £4,985 0 0	Cruwey & Hol	£2,583 15 6
King & Sons 3,997 0 0	"Progs."	3,997 0 0
"S. 1,203 0 0	Lloyd & Powell 3,990 7 0	
W. Cowlin & Son 3,330 0 0	Lore & Walte 3,300 0 0	
"S. 1,350 0 0	S. Ambrose 3,043 0 0	
Roach & Son 3,395 0 0	"S. 1,350 0 0	
"S. 1,350 0 0	Porter & Harrison 3,300 0 0	
E. H. Toulmin 3,395 0 0	"Aldershot" 3,300 0 0	

\* Accepted.

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# The Builder.

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FEBRUARY 10, 1894.

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### The Bath Pump-Room Competition.



HE unsatisfactory incidents in connection with this competition have excited more than usual interest in the exhibition of the drawings submitted, which are now publicly exhibited, and are being visited by a large number of the people of Bath. The number of the competitors is small for a competition which should have been particularly attractive to any architect who has the least spark of sentiment for his art. There were, however, only fourteen sets of drawings sent in, and of these only two are serious contributions from the architects of the City of Bath. Of these two, one is by Mr. T. B. Silcock, a clever designer, but a young practitioner, and the other by Mr. C. E. Davis, the City Surveyor. Of the five members of the Royal Institute who reside in Bath not one is a competitor. Why? Probably because they knew too much.

The absence of most of our regular competition architects is sufficiently accounted for by a perusal of the particulars. There is quite inadequate information as to the accommodation required and the purposes for which the additional buildings were intended. Then later on is inserted a very remarkable clause, "The above particulars are considered to be all that is requisite for competitors to be supplied with in order that they may compete, and no other information will be afforded under any pretext whatever." There can be no doubt that the Corporation of the City of Bath, by permitting such particulars of competition to be issued, have barred themselves from receiving so much the talents of the profession as would have been obtained by a competition in which it is made clear that all competitors would receive fair treatment.

The Mineral Baths Committee should thank themselves exceedingly fortunate that with so discreditable a competition they have nevertheless so able an architect as Mr. Brydon to receive their instructions.

The drawings submitted by the various competitors differ principally in the ideas of their authors as to the proper method of

treating the Great Roman Bath. The problem to be solved was, briefly, the erection of a new Concert-room larger than the present Pump-room, but adjacent thereto, and the covering of the Great Roman Bath so as to fit it for a part of the museum under the Concert-room, and at the same time as a lounge in connexion with the Concert-room. There were also to be provided a ladies' parlour and five or six other public rooms, the sizes and purposes of which were no further explained in the precious particulars "considered to be all that is requisite."

In the design by Mr. J. M. Brydon, placed first by the assessor, the Concert-room is placed with its axis at right-angles (or practically so) with the axis of the Great Roman Bath, thus admitting of ample entrances and exits both from Abbey-yard and York-street, as well as from the Great Roman Bath. A wide corridor on one flank of the Concert-room, an entrance-hall on the other, and the principal entrance and staircase in front, with a terrace to the Great Roman Bath at the back, are the means by which this amplitude of access is obtained. Mr. Brydon has evidently taken the view that the five or six other public rooms were not intended to be of large size, and were to be distinctly separated from the Concert-room, and starting from this point has had no difficulty in producing a good plan on a site which other competitors clearly felt to be cramped. In his treatment of the Great Roman Bath, Mr. Brydon has put a segmental barrel vault over the piscina, carried by Doric columns standing on the existing remains of rectangular piers, and lighted by lunettes. The Concert-room has a flat segmental dome over its centre, with a semi-dome abutting at each end, the orchestra gallery being in a segmental recess from one of the longer sides, as in some Continental examples, and with an entrance below through a circular hall, which is cleverly arranged. Mr. Brydon's design would produce a Concert-room very charming in effect, but in which probably band music alone would have any chance of being adequately heard. In exterior treatment the design has, of course, been much fettered by the proximity of the present Pump-room, and it is sufficient to say that the design is quiet and sober, and well harmonises with the existing building. In the exterior treatment of the Roman Bath, Mr. Brydon's design is

severe almost to plainness—a logical and defensible treatment, but "caviare to the general."

In the design marked "O" it is generally recognised that the drawings have been submitted, though not necessarily prepared, by Mr. C. E. Davis, the City Surveyor. The plans show extensively the adjoining baths and other adjuncts, with a completeness which only the information in possession of that official could render possible. The knowledge that existing buildings closely abutting on the site are to be removed also gave him a superior advantage over other competitors. In this design the Concert-room is placed contiguous and parallel to the Great Roman Bath—in which is inserted a gallery all round, on the Concert-room level. The Great Roman Bath has a semi-circular barrel roof, carried on Doric columns, as shown on the sections, though these are omitted on the perspective, which therefore at first sight gives the impression that the Roman work is little interfered with. The architectural features of the design as a whole are somewhat curious, as it is evidently intended to lead from the severity of the Pump-room to the ornate treatment of the Queen's Baths, erected from Mr. Davis's designs. The Roman Bath is therefore dressed up in the small and elaborate detail of the remainder of the York-street front of the Queen's Baths, while the new Concert-room has semi-circular headed windows on one side to accord with the Pump-room, and square-headed on the other, with quite a different style of detail.

The third premiated design, by Messrs. Baggallay and Bristowe, in many respects is on similar lines, as far as plan is concerned, to the second premiated design "O." It was an error of judgment to make the staircase to the public rooms on the first floor so very important, although "a good staircase" was asked for. The public rooms are ample, and the entrances well managed, though not equal to those in Mr. Brydon's design. The Roman Bath is a skillful "restoration" in the French student's sense of the term, and certainly a fine interior, but more costly than the circumstances will allow. Externally it is plain and unadorned, the designers being clearly unaware that the adjacent houses were to be removed. The design of the Concert room and its adjuncts is in exterior treatment one of the best



attempts made to form a pleasing elevation with the Pump-room as a part and the keynote. The interior has a very flat segmental-domed ceiling over the centre, with elliptical arches completing the parallelogram, and in its detail thoroughly continues the tradition of Bath in its palmy days.

After the three premiated designs, that by Mr. T. B. Silcock is entitled to a high place. Unfortunately, Mr. Silcock, although a local architect, appears to have misconceived the purpose of the proposed extension. His Concert-room would make an admirable ball-room; but reasoning in the light of the premiated designs, the public rooms should not be entirely open to the Concert-room, nor should the galleries of this be only accessible through the public rooms, or "salons" as they are called by Mr. Silcock. The author places his Concert-room, as in the first premiated design, at right-angles to the Roman Bath, and treats it in a logical way with a two-story arrangement of Doric and Ionic orders divided by the gallery which runs all round, utilised at the one end for the orchestra. This is a sensible arrangement, and though somewhat lacking in dignity, is well carried out. The Roman Bath is simply treated, the old work being undisturbed, but the roofing, as suggested, would be a difficult problem, and would necessitate more elaborate and more expensive ironwork than is even hinted at in the drawings. A girder 80 ft. span is not a light matter to construct, and the author does not appear to have fully grasped the difficulties of his problem in this respect. Setting aside the weaknesses we have noted, although it must be admitted they are crucial, Mr. Silcock's design is entitled to very high honour. The exterior, with its central tower of modest but sufficient dimensions, is one of the best, if not quite the best, in the competition; the planning, apart from the mistaken point of view, is good; the interior treatment of both the Bath and the Concert-room suitable and pleasing; whilst the draughtsmanship, especially of the perspectives, is inferior to none, if, indeed, it be not superior to all.

The remainder of the designs fall a long way below those already mentioned. Those marked D and G are the productions of gentlemen who may be commended for their pluck, and who may hope in ten or twenty years time to be within measurable distance of a premium if they work hard and learn to draw. Messrs. Malcolm Stark, & Rowntree are put out of court by the resemblance to a railway station which their iron roof spanning the whole of the Roman Bath suggests. They have hardly caught the spirit of old Bath in the additions to the existing Pump-room, with its peculiar character. Messrs. Lawson & Donkin have transgressed the conditions by a perspective which cannot be said to be "in monotone or etched," a fact which we gathered spoilt the chances of a good plan. The circular angle introduced at the nearest point to the Abbey is almost an insult to that venerable building, and an unfortunate feature, out of harmony with the rest of the design. Mr. J. B. Peverelle's design has the merit of leaving the Roman remains as little undisturbed as possible, but the triple span shed roof is too station-like in character. Mr. J. C. Carter's plan has considerable merit, but here again the station roof spoils the design, which, indeed, is, in the main, out of harmony with the existing Pump-room. Mr. C. A. Nicholson's design has no very great fault, but is below the average of the best. Messrs. Burgess & Oliver's design has many points of merit, but is defective as to plan in entrances and exits. The Roman Bath is enclosed in a distinct building, with a hemispherical glass dome, and the treatment generally is quiet and suitable. Mr. F. Todd's scheme is marred by the iron and glass conservatory, with circular iron staircases, with which he proposes to enclose the Roman Bath. Mr. F. B. Bond has produced a good plan with modest treatment of the Roman Bath, building on the old piles, but

the detail of the Concert-room needs more study, and the design generally is ungrammatical except where features of the existing building are reproduced.

#### NOTES.



WE have received at different times during the last few months announcements from patentees and manufacturers connected with building work, that they have been awarded a medal at the Chicago Exhibition, and requesting a notice of the fact in our columns. For a long time past we have felt obliged to make it a rule that we can only publish official lists of awards of this kind; partly because the publication of a few such awards, on a private notice of them, is rather an injustice to other recipients who may not care to announce to us their own honours, partly because we regret to say that in more than one instance we have been misled by false or inaccurate statements from people who professed to have actually received awards which they had only, in fact, thought themselves entitled to. But the official list of awards at Chicago it seems impossible to obtain in any complete or authorised form. No list of awards has yet been issued, and it seems quite uncertain when one will be; so we learn from a circular from Sir Henry Wood, who acted as the representative of this country at the Exhibition. Only some general and unofficial information has been received as to the number and names of the awards in some departments; in fact, the whole thing seems to have been hopelessly mismanaged. Whenever (if ever) we can procure a complete and authenticated list of the awards, we will publish a selection from it, giving all the awards for exhibits which fall within the scope of this journal. But we very much doubt whether such a list ever will be obtainable.

IN conferring a baronetcy on Sir E. Burne-Jones the Government has done credit to itself, although a title of this kind clashes rather oddly in the mind with the associations generally connected with the works of this artist. However, as we have no "Legion of Honour" in England, this kind of addition is the only official way in which the Government of the country can mark its appreciation of artistic genius, and we may be glad to find that there is an increasing tendency to recognise the claim of eminent artists to any such mark of esteem as the State is able to confer on them.

IN the last issue of the *Classical Review* (double number, January-February) appears a brief report of the work done last year by the British school near Kyparissia. The site of Basilis (mentioned by Pausanias, viii., 29) has been identified, and probably that of the neighbouring Bathos—about 10 stadia away. At Bathos every third year rites were celebrated to the "Great Goddesses." On the site supposed to be Bathos about seventy terra-cottas have been found, many of local fabric, and the earlier specimens of rude archaic style; among the latter specimens the most frequent type is that of a standing figure holding some object to the breast. A few bronzes were found—a bull, a jug, the handle of a vessel decorated with reliefs, and two engraved rings representing a youth and a female figure, all earlier than the fourth century B.C. On the second site, which is held to be the road leading to the Acropolis at Basilis, were found an interesting series of bases of statues, these bases being ornamented with an elaborate key-pattern, and dating not later than the sixth century B.C. It is to find of this peculiar character, and especially to terra-cotta used in votive offerings, that we must look for light on the many obscure local cults which form the basis of the ultimate Olympian religion. The same

number gives a report of the recent acquisition of the National Museum at Athens, among which are conspicuous a series of lekythos from Eretria, and a pyxis with the scene (hitherto unrepresented) of the birth of Apollo and Artemis in the presence of other deities.

A CORRESPONDENT informs us of a rather curious case which has recently come under his notice. A specification provided that the mortar used on certain works should consist of one-third "blue lias lime" and two-thirds of a certain (usual) quality of sand. The sub-committee having charge of the works entertained doubts as to the quality of the mortar, and lost confidence in the clerk of the works. They directed the architect to have an analysis made, and when the analyst's report came before them a most alarmingly small percentage of "lime" was recorded. It was, however, pointed out by a member of the committee that the analyst had almost certainly reported the percentage of "calcium oxide," which is, of course, only one of the constituents of "blue lias lime" (which constituent it contains in a much less proportion than many other limes) and that, therefore, though the mortar might be deficient in lime, yet it could not be as bad as would appear from the analysis. On the matter being brought before the contractor, he pointed out a further source of error, namely, that the percentage of constituents given by the analyst was, of course, by weight, while the specification, equally of course, dealt only with measure. Modifying the results of the analysis by these lights, very different figures were obtained, though the proportion of lime was still below the mark. In the result an expert pronounced favourably on the quality of the mortar; the work was allowed to stand, and the mortar has, so far, justified the decision.

THE Report for the past year of the Surveyor to the Fulham Vestry (Mr. Norrington) shows that a good deal of difficulty is being experienced in the district, from smells from the sewer gratings, and the Surveyor recommends upright ventilating shafts with cowls wherever it is possible to have these erected. He also adds the recommendation that before new streets are apportioned a special examination be made of the sewer, and that any improvements which can be made in the ventilation be made before the street is taken over. At the conclusion of this portion of the Report he also strongly recommends that continued efforts be made to induce the London County Council "to increase the necessary pumping power, or otherwise to facilitate the discharge of the sewage of the district, also to increase the ventilation, or by other means to improve the condition of their sewers in this district." The report contains some useful information as to the advantages and disadvantages of different kinds of wood-block pavement. The deal block paving in the Fulham-road, laid in 1885, has given out very badly, and the Surveyor advised the Vestry to have it relaid at once. We do not know whether it should quite be expected that ordinary deal block paving should last longer than that under a large traffic. Experiments have been made with Karri and Jarrah wood. Strips of the two woods were laid side by side on the King's-road in July, 1888, and after these blocks had been down four-and-a-half years without being disturbed, the Surveyor of the Chelsea district reported that the Karri surface was  $\frac{1}{4}$  in. above the Jarrah, and the Jarrah  $\frac{1}{4}$  in. above the yellow deal. The Karri wood, it appears, is also slightly cheaper than the Jarrah. Probably the extreme hardness which makes it specially suitable for paving blocks renders it unsuitable for some other classes of work. One objection raised to the hard wood blocks is that they are more slippery than deal, on which the Surveyor comments that as it is admitted they are



cleaner, and slipperiness is generally the result of dirt, proper scavenging should obviate the complaint.

[N reference to our "Note," page 49 *ante*, condemning the adoption of the penny-in-the-slot system for opening the doors of the w.c.s. in the new conveniences near the Marble Arch, the Surveyor to the Vestry, Mr. Livingstone, writes to us to say that there was no intention of leaving this as the only method of access to the closets, and that attendants are always in charge who, if necessary, open all the doors with their key, independent of the "slot" mechanism, which was only introduced as a means of checking the amount of money received. It seems a rather illogical arrangement to do this by a system which can hardly be made compulsory; but of course the Surveyor's explanation quite alters the case. We were under the impression that the "slot" system was introduced, as some railway companies introduced it, to save the necessity for continuous attendance; otherwise we should not have made the strong objection which we did to its adoption.

THE Report to the Local Government Board by Dr. Wheaton on the causes of an outbreak of enteric fever in the town of Atherton states that the outbreak was regarded locally as due to emanations from the privy-middens, many of which are undoubtedly in a very filthy condition; accumulations of filth in them are very common, and they are usually sunk below the ground level and are uncemented; their contents are often almost liquid, owing to the custom of throwing slops into them, or owing to their being uncovered and receiving rain water from the roofs of houses around them. The upper closets are directly connected with the sewers, and in many instances are in a filthy condition, being entirely devoid of any apparatus for flushing them. In spite of the above defects it was found that the disease was not present in the greatest intensity in places where excremental nuisance was specially marked; many cases indeed occurred in households where the method of excrement disposal was not in any way defective. Attention was then turned towards the water-supply (one or two other possible sources of disease having been examined and dismissed), and after long examination it was concluded that the illness was connected with the use of a portion of the water-supply consisting of the water collected on a piece of common land about 80 acres in extent, known as "The Outwoods." This led to an examination into the causes which might have rendered "the Outwoods" water-tightly unwholesome, with the following result, which is of some interest as showing the roundabout ways in which water-supply may be injuriously affected:—

"The long period of drought in the spring, caused, as was informed, the soil of the Outwoods to become cracked with numerous fissures. On May 17, three days before the water was turned into the town mains, there was a heavy fall of rain, amounting to 24 in.; as will be seen from the chart of rainfall appended. A few days after this fall of rain, the Outwoods water was noticed to be brown and turbid, which was attributed to the manure from the cattle grazing in the Outwoods having been washed on to the field pipes, owing to the cracked condition of the surface of the ground. The water was drawn off from the town mains within the epidemic area in the morning after the commencement of the turning in of Outwoods water on May 20 was also turbid, and I was informed that it usually stank after it had been standing a few hours. On June 9, the Medical Officer of Health took a sample of the water from the Fitters Monument; it was muddy, of a brownish colour, and after standing deposited a brownish-yellow sediment. On examining this sediment I found that it consisted chiefly of decaying vegetable matter. From time to time there were complaints of the turbidity of the water drawn from the town mains in the morning. A further period of drought of other heavy fall of rain occurred on July 11 to 16 inches; with the result that the water became turbid again, and on July 15 the turning in of Outwoods water into the town mains was in consequence given up. On August 2,

owing to there having arisen suspicion of relation of the fever to this water-supply, a specimen was drawn from the Fitters Monument tap, and sent to A. Bostock Hill, Esq., the county analyst. No definite evidence was forthcoming as a result of the chemical analysis of the water tending to show that it was implicated in the origin of the fever, but it may be mentioned here that he described the water as rather turbid, containing some brownish suspended matter.

There can, therefore, be little doubt that a quantity of organic matter was washed into the Outwoods water on two separate occasions; and it is most probable that the infective material of enteric fever was washed into the water at the same time. What was the origin of such infecting material, whether the poison was contained in the filth removed from the pond, and spread upon the ground, or whether it was due to actual faecal matter having been washed into the tank or collecting pipes, it is now impossible to say."

THE Royal Botanical Society, which has applied to the Treasury for an annual grant in aid, was founded in 1838. It obtained from the Commissioners of Woods and Forests a lease of a plot of ground about eighteen acres in extent, which was at the time tenanted and in part planted by Jenkins, a nurseryman. It had previously been chosen, upon the laying out of Regent's Park, for the site of a vast monument to commemorate the battle of Waterloo; by another scheme a royal palace was to have been built there. The gardens were laid out by the late Robert Marnock (who had been designer and curator of the similar gardens at Sheffield), in conjunction with Decimus Burton who designed the big conservatory. It is stated that the society's aggregate expenses amount to about 6,000*l.* per annum; it pays a high rent; and during the last fifty years has spent a large sum of money, including 54,000*l.* for prizes in exhibitions.

THE commencement of an article in the *Fortnightly Review* by Professor Goldwin Smith, on "Oxford Revisited," is an amusing example of that confident ignorance with which architectural subjects are treated by writers who have never paid any attention to them, but who seem to think (with the editors of the *Reviews* in which they write) that the fact of knowing something else gives them a right to dogmatise about architecture. Professor Goldwin Smith begins his article by complaining of the dilapidation of some of the buildings. "For the second time in my memory the spire of St. Mary's is being restored. It seems not to matter what stone is used." If he had inquired where he could have got correct information, he would have learned that the decay of St. Mary's spire was specially due to the use of bad stone at the previous restoration, and that in the present work the greatest care has been exercised to procure a sound and durable stone. The next sentence is still better. "Pugin's gateway at Magdalen was of Cannes stone (*sic*), yet it was crumbling, I am told, before it was pulled down." Here the Professor has evidently been pumping someone verbally about the stone, has mistaken the word "Caen" for "Cannes," and is not aware that Caen is a by no means durable building stone—a fact which destroys all the point indicated by his "yet."

#### THE ADVANCEMENT OF ARCHITECTURE.

ROYAL ACADEMY LECTURES BY PROFESSOR AITCHISON, A.R.A.—LECTURE II.

THE boast of architecture is that it does not merely give the appearance of persons, things, or the face of Nature; but that it is an attempt to emulate the higher natural organisms, in the making of a shell for man's use or habitation. To emulate Nature's organisms, each building must be exactly fitted to its uses, but I will not at present consider those that are solely for material needs. Those for man's habitation must not only be fitted to his material wants and occupations, but to his mental proclivities, and to the natural grouping of the usual occupants; but even this is not enough, for it must also be arranged for the groupings of those occasionally

meeting there. A few buildings are for the ordered groupings of many, under a law or a ritual, such as churches, chapels, and meeting-houses, and particular parts of many other buildings, such as the reception-rooms of Royal palaces for *levées* and drawing-rooms, the council-chambers of civic corporations, where, besides the ordinary debates, deputations are received and honours conferred. Buildings of a similar character form a descending series from the great and time-honoured Corporation of London to the smallest vestry-hall of the suburbs. The Courts of Civil Law afford another instance. This age, however, is peculiarly inimical to anything symbolic. For various effects, organised groupings, or grand processions, we have to go to the playhouse.

There are other buildings for the grouping of numbers, who, when swayed by strong emotions, group themselves in different fashions. In these piping times of peace, very little strong emotion is shown, except perhaps in those halls so expressively called the "halls of wasted footsteps," where unhappy suitors congregate.

It may be taken for granted that if the requirements are accurately carried out, each building would roughly express externally the uses to which it is devoted. It would not do so to the unobservant or the unreflective, unless it were adorned with figure-sculpture illustrating its use; but its shape, its doorway, and its windowing must to some extent explain its use, and at any rate it would have a marked character of its own. In addition to this every building should be so arranged that its outside may give some degree of pleasure to the beholder. We have seen that the reason for this is to compensate the surrounding inhabitants and the beholder for the light and air they have been deprived of, and for the instruction and pleasure they would have gained from the prospect.

In the case of buildings wholly erected for emotional purposes, the architecture should if possible raise the right emotions, or at least those of a cognate character. In buildings of a mixed character, only those parts which are devoted to emotional use. In a house, for instance, we do not have any high emotions raised by the coal-cellar, the knife and shoe room, the scullery, or the larder; and if, as it is described in old plans, the dining-room were a mere eating-room, you would not have any of the higher emotions associated with it; but the dining-room is now as much connected with intellectual conversation, with fruit, flowers, handsome furniture and beautiful pictures, as with eating and drinking. In it the refreshment of the mind should be as much cared for as that of the body.

Coal, wine, beer, and spirit stores, warehouses that only protect goods from plunder and the weather, are of the purely unemotional sort, while most workshops and offices are a degree higher, for they house beings generally more intelligent, and who are engaged on higher work, than mere motion and muscular exertion. Offices where the heads control the supply of necessities to large sections of mankind, or arrange for the relieving the people from the incidental evils of life, should express more importance and dignity. Workhouses have hitherto been, aesthetically, very unfairly treated, for from the benevolent point of view, there is something much higher in rescuing those from misery and premature death, who have been impoverished by no fault of their own, than in protecting raw material from wet and robbery. If workhouses be mainly filled with the lazy and the worthless, that is purely a fault in their management; and they certainly have helped to protect the country from revolution. Such buildings should bear their proper stamp, and not be confounded with those for the storage of goods. Hospitals are equally benevolent institutions, for they aid the sufferers from accident or disease, and restore many to their occupations; and, in the case of fever hospitals, greatly lessen the chances of contagion or infection among the healthy. Markets must at least be divided into three classes: the highest, calling for the greatest care, attention, and effect, are those where plants, flowers, and fruit are sold; for these beautiful things appeal to our sensibility by their form and colour, and sometimes by their perfume. The middle class require mere sightliness, and are those where common necessities, such as grain and roots, butter and cheese are sold, that do not appeal to the eye by their shape or colour, and often offend the sense of smell, too, particularly in the case of garlic, onions, and cheese; while the lowest class comprises the shambles, where flesh is sold to keep up our ferocity, and to pander to our depraved tastes, and give us gout and rheumatism.



There was a decency about the ancients in this matter which we have discarded; they at least professed that their hecatombs were slaughtered to please the gods; we must not forget that the world which was conquered by the Romans was conquered on wheat-meal porridge. Barracks require a higher expression than workshops or workhouses, for they are villages for the housing, feeding, and disciplining of soldiers. The men who live in them have devoted their lives to the preservation of their country, the highest patriotic duty that man can perform. Our modern international warfare has been but a duel, in which you are only allowed to disarm, wound, or kill your adversary, and possess yourself of his valuables; in real warfare the country and all the property in it becomes the possession of the conqueror, and he either destroys the people or turns them into beasts of burden, and we are not sure we have yet seen the end of war.

Most buildings have some special use for their main ends, the distinction between them is the relative proportion between the parts for emotional and unemotional use. The commonest sort of buildings are wholly for material needs, and buildings gradually rise in position as the emotional parts prevail over the material.

Religion, however, has been and must always be the mother of architecture in its highest sense; for beyond providing for the ritual, the whole cause of the building is to raise the highest emotions.

I cannot conceive man ever being without religion; by his natural curiosity about himself and the universe is attempted to be satisfied, the question of what is happiness is defined, and he is shown how he may try to attain it; by it he is taught to bear the terrible ills with which life is fraught, and how to purge his soul from guilt. A cube with a recess for the altar was the shape chosen by the early Christians for their Church. The shape we now have is mainly accidental. Constantine saw in his vision a cross, and he presented the Christian community of his day with the unused Basilica of Lateran, in which the Christians saw the raw or primitive cross in the junction of the transept in front of the judgment seat, with the nave.

The Romish Church greatly enlarged the early Christian symbolism, and either invented, or adapted from the pagans, an elaborate ritual, both grand and impressive. No one who has seen the open-air service of the Corpus Domini at Venice can fail to have been struck by its grandeur and solemnity. From the left door of St. Mark's the procession emerges; besides the officiating priests bearing candles, each confraternity of Venice sends some at least of its number, dressed in the handsome costumes of the sixteenth century, who bear on their shoulders a tray or baldachino containing the sacred relics in their gold and silver cases, enriched with enamel or jewels. Each confraternity is accompanied by children dressed as cherubs, or personating the childhood of the holy personages of Scripture, leading lambs, kids, or a donkey adorned with flowers. In the centre of this procession is the Patriarch of Venice, with the attendant priests and acolytes, sumptuously attired. By the time the procession has brought the Patriarch to the centre of the square, the foremost group has passed under the Procuratie to the right door of St. Mark's; the Procuratie is lined with sightseers, and the open square is crowded with gondoliers, peasants and their families, all dressed in their holiday attire. At the end of the celebration of the mass a bell is rung as the host is elevated and incensed, and then the whole crowd fling themselves on to their knees or kneels in the blazing sun. The effect of this sudden and united adoration of the multitude is quite electrical, and, when once seen, can never be forgotten.

We Protestants inherited the churches and cathedrals, but had neither symbolism nor any ritual to speak of, trusting not very wisely to that part of the faith that is purely intellectual.

The churches and cathedrals built for the Romish faith were often of costly and beautiful marbles, and were always full of pictures and images; the priests were gorgeously robed, the altar was always splendidly adorned, and the service conducted with symbolical attitudes; while the curling smoke of the drowsy incense, only used at the church services, cut them off from everyday life, and linked them, in the minds of the learned, with the gorgeous rituals of a faith that had passed away.

Cathedrals were surrounded with chapels of saints, besides having the Lady Chapel behind the altar, and there were often chantry chapels as well. Processions were in daily use, and on great occasions the cathedrals were draped with hang-

ings, and the sacred relics and utensils were borne in procession round the whole edifice. The very aisles marked a former distinction. Protestants know not what to do with a cathedral when they get one, and if their churches were to be built in accordance with their wants, would resemble the theatres of the ancients, only roofed.

What form the church of the future may take, we cannot conceive.

If we will only take the trouble of thinking, we can pretty well tell the character of the emotions that each sort of building should excite, though it is not quite so easy to sort them, as it might seem.

It is customary to call the body, those parts alone that are not the organs of thought, will, and the affections, and I shall keep to the ordinary nomenclature. The body can be improved in strength and comeliness by pure air and sunshine, sound food and drink in moderation, by exercise, cleanliness, and the proper alternations of heat and cold; this, however, does not only improve the body, but the mind, for mental vigour mostly accompanies bodily vigour, though there are notable exceptions.

We have no word but a Greek one, "Gymnasium," for a building devoted to bodily training, in which every muscle should be exercised, and the proper co-ordination of the body be carried on, the movements instantly following the directions given by the eye or ear, while every motion should be dignified and graceful. It is the want of what the Greeks included under music, the harmony and gracefulness of every movement, action or speech, that helps to render us so inferior to the ancients.

Gymnasium means a place for the naked, and we do not so exercise. Yet, not to speak of the architecture, a gymnasium would be a fine opportunity for displaying sculpture of the exercises of the ancients, and of our own, if the English athletes were in one tight-fitting dress, for though much of the beauty of the modelling would be lost, some notion of the general form and action would be given.

We have no word for a building devoted to the training of the will, for there is no such building, and no such training, except incidentally, though this training alone can be dignified with the name of education. We have schools and colleges for the mental training of youth, institutions where men train themselves and others for mutual information and encouragement. Even though we be the strongest advocates for bodily training and the greatest admirers of bodily perfection, I think we must admit that those who have arrived at great mental excellence are in a higher grade, and have mostly conferred greater benefits on their fellows; and we should treat the buildings aesthetically, according to the importance of the training they give. There are also buildings for insensible instruction, such as libraries and museums; for State, as Royal and Municipal palaces, and for the reception of foreign ministers; buildings for pleasure and instruction combined, such as concert and dancing rooms, picture galleries and theatres. We have only two or three mansions in England built with public money for great generals, to mark the nation's gratitude for the national benefits they have conferred—such as Blenheim for the Duke of Marlborough, and the Duke of Wellington's house, although this should have been much grander. The want of grand houses to mark the gratitude of the nation to its great men, is only one of the proofs of the ignorance of our statesmen of the value of the fine arts.

No one can see Blenheim without being struck with its architectural magnificence as well as its size; and consequently Marlborough's victories over the armies of Louis XIV. are constantly being recalled to the memory of succeeding generations; while Wellington's house is neither large enough nor admirable enough as a work of art to excite attention. It is, however, a house rather more important than a common one, and so can be used by those who know it to point a moral or adorn a tale. We miss, too, in the fitness of things, a house to Nelson, who did quite as much for the preservation of England as Wellington himself. Of course, the saving of the nation from conquest is the most important service a man can render to his country, though I cannot help thinking that diplomatists, who secure this end without the horrors of war, are quite as deserving. I suppose the State has a right to restrain its public honours to soldiers, sailors and diplomatists, but even to them the presentation of a really fine house is the most useful and enduring memorial of the nation's gratitude. Wealth is due to these great men, as they have preserved that of the whole country; to be made

equal with the highest of the living is not much, for they are already their superiors; bronze statues make their personality known, but in any popular commotion, these may like the statues of the great Sejanus, be turned into coal-scuttles and warning-pans.

There are, however, other great men who not only confer benefits on their own country but on the world at large, who I think might too be honoured in this way during their lifetime. Their achievements are not so striking at the time, nor are they so forcibly brought home to every one as victories are; consequently their works, discoveries, or inventions, are only fully appreciated after their death.

Shakespeare and Milton, Bacon and Locke, Inigo Jones and Wren, Newton and Dalton, Watt and George Stephenson, Reynolds, Constable, Turner, and Flaxman, have done more for their country than any conqueror; for they have not only enriched and immortalised their country, but have helped forward every other civilised nation.

It might be supposed that the leaders of labour—I don't mean the misleaders—would desire to celebrate their well-earned fortunes by magnificent houses, but like those successful in fraud and adulteration, they are mostly content to enshrine themselves, their achievements, and their wealth, in the ready-made house of the speculative builder. Poverty, the leasehold system, want of sense, and want of taste, keep London very free from magnificent houses.

Any great achievement should be painted in some of our great public buildings, or there should be a building for the purpose. One of the follies of the age is to overlook the necessity of symbolism, to make mankind feel the importance of a great event, or a great privilege. Can it be supposed that the people appreciate the benefit of living in a free country, of voting for their representatives, or for their council, if they have to slip the paper with their mark into a rough deal box in a shed or a public-house?

The building that holds all but the highest place in a country is the Parliament House, under whatever name it goes, where laws are made for the governance of the country, where honour is awarded or punishment is decreed to the greatest in the land, and where the questions of peace and war are debated.

In so large a proportion of buildings the arrangements are permanently made to meet known requirements or groupings according to a law or a ritual, and unless free grouping under strong emotions were generally to result in particular shapes, it would be impossible to provide for them. We might make hall-rooms circular or elliptical if they were confined to round dances, but neither would be convenient for square dances.

The same might be said of dining-rooms if the old law were observed, that the party should not consist of less than the Graces nor more than the Muses, though this law supposes general conversation, which is hardly to be expected in England; besides round and elliptical rooms waste much space. For public banquets, where set speeches are made, the square or oblong room is convenient enough if the chairman can be heard by the guests, and the guests can be heard by the chairman.

I cannot help thinking that, if the outside of isolated public buildings were made the outcome of the inside, they would differ greatly from those formerly in fashion here. Then the architect's idea was to make a box, and sometimes a very beautiful box, into which the group of buildings was put; but under such conditions it was impossible to judge the purpose of the building from the outside.

Some eminent architectural critics say, that to insist on the outside being the outcome of the inside is a most pestilential heresy; they contend that a beautiful front is wanted to excite admiration, and if this be achieved what more can be desired? In answer to this, it may be said that a building designed on such principles does not emulate one of Nature's organisms.

It may now be well to consider of what a building consists when looked at from the outside. It consists of walls and a roof, unless the roof be flat or hidden, and then of walls only. If there be windows we conclude there must be a roof. It may be as well to speak of the doorway before the windows, for if Dr. Dörpfeld's theory, that Greek temples were lit only from the door, be the true one, windows were not wanted, and the size of the doors must have been proportioned to the spaces to be lit. Doorways in Mediaeval buildings were sometimes used for lighting, as at the Lower Church at Assisi. In Gothic cathedrals the height of the doorway is said to have



en regulated by the height of the banners rried in processions.

There is such a thing as æsthetic lighting, though has been denied. Nothing, for instance, could have been finer than the light thrown from the or of a temple on to the idol at sunrise; we can age of the effect by the gorgeous appearance esented by the choir of St. Lorenzo outside the ells when the setting sun flames through the estern eye.

Æsthetic effects are produced in two ways; stly, where the light is pure, and is used to oduce a strong mental impression, as well as to uminate. Of this sort of lighting the Pantheon rome is the most brilliant and complete ample, for though all other buildings lit in the me way are effective, they are on a smaller scale, id their architecture is not to be mentioned in e same breath with that of the Pantheon. The hole light in the Pantheon coming from that ormous eye in the top of the largest masonry ume in the world, produces the most solemn and blime effect, and the deep blue shadows cast by e coffers on the whitewash are never to be rootten. There is, too, a sort of faint echo of e single brilliant foot of light coming through e eye in the chequered light from the bronze ight, subdued by coming through the deep rtico.

In churches, and in some secular buildings in countries, the effects seen in forests are often roduced. You look into gloom from light, or on light into gloom. In the Lower Church at asse, where there is only a dim light in the ave, you look thence on to a blaze of light from e open north door at the west end; the door self is not visible, only the illumination from it. n Strasburg Cathedral you look from the bright ave into the gloom of the grand apse. Both ects may be seen at the Alhambra at Grenada, here you look from the dark rooms into the lazing sunshine of the courtyards, or from the unny courtyards into the gloom of the chambers.

The same effect is seen from the little chapel n the north side of the choir of St. Mark's, here from the gloom you get a glimpse of the eat west window of the nave, while by standing n the light transept, you see the gloom of this ttle chapel with one gleam of light from its nute window. By looking from the nave cross the grey aisle into a chapel lit by a small ndow at Sta. Maria in Cosmedin at Rome e see an almost identical effect, though similar icturesque lighting may be seen in many a ountry cottage in England—accidentally produced e true, but none the less picturesque for that.

The other æsthetic lighting is got by turning ells into picture galleries of stained glass, mostly een in Saracen houses and in European churches. Nothing produces a poorer effect than this, when the glazier has had the mean ambition f trying to rival painting in his windows, and ms at making his subjects distinct, well drawn, nd composed. It is only when the glazier was n inspired colourist, and felt that in colour alone e must put his trust, that we get that affluence of alpitating coloured light that wraps us into ecstasies, and brings all heaven before our eyes. It was only when he had studied how his little its of coloured glass could be melted by the sun nto heavenly harmonies, that he surpassed all the ther arts, by producing rapture in the entranced eholder; this enchantment can perhaps only be nanced by clouds of perfumed incense, floating cross the coloured beams of light, and by the ofttest tones of the organ dying away in the ears. The only other use of stained glass is a prosaic ne, to hide the sight of a dead wall, ugly eds, or a rubbish heap, in some narrow space here no sun can get in. Where divine effects re to be got, the sun must lend his aid. We must always remember that stained glass is only ermissible where a "dim religious light" is all hat is wanted; for we must have pure light when anything worth seeing is to be properly xamined.

In some old halls a good effect is got by having mall windows high up in the main body of the hall, and so keeping it rather dark, by recessing he ends of the dais beyond the walls of the hall, nd filling each of these recesses with one large ndow reaching from the level of the table o the underside of the cornice. When the dinner goes on by daylight, the high table is n a flood of light while the hall is dim; ut by this device, the walls of the main hall are sacrificed; for pictures on them cannot be seen.

Windows moreover answer a double purpose, hey let light in for use and pleasure, and can e looked out of for amusement.

In the case of belvedere, which are built oley for the view, we can afford to sacrifice the

walls of the room for the sake of the prospect, but in the case of houses where a fine prospect is as it were thrown in, it is best to confine the outlook to the best prospect, and to make the ndow at one of the narrow ends of the room, so that the two side walls may be used for pic- tures or other works of art, but there is no objection to the end window being a semi-circle or half-octagon.

For any building that is to be occupied for work, for living in, or for pleasure, the lighting is of supreme importance.

In the first case, bad lighting not only causes mistakes in the work, but injures or destroys the eyes of the worker; in the second, it lowers the health and interferes with sewing and reading; and in the third, it prevents the pictures or other beautiful objects in the room from being properly seen. For the ordinary dwelling-house where the rooms are mostly square or oblong, and when the longest side of the oblong is not more than once and a half, or once and three-quarters of the narrow side, I consider the lighting is sufficient, if at the far end between sunrise and sunset there is enough light to read by. This amount of light is attained by allowing one foot of light for every hundred cubic feet of space in the room; though it is just as well to allow a little more, provided that the light be admitted from one opening carried up to the soffit of the cornice, and that the light is absolutely unobstructed. If the light be obstructed then we must gauge with the photometer the loss of light, and increase the area accordingly.

In cities unobstructed light is rare, and is not often obtainable even in the country, as trees, shrubs, and rising ground mostly obscure much of the lower light. In towns we may say that very little light comes through the lower part of windows, and that we should only regard that part where the sky can be seen.

Gwilt says there is a gallery in Windsor Castle that is 90 ft. long, 34 ft. wide, and 33 ft. high, lit by a north window that nearly fills the narrow end, and that it is amply lit. We may suppose the window is below the cornice, and some 2 ft. from the floor, the contents of the room are 100,980 cubic feet, and the area of light 1,020 superficial feet, or just over 1 ft. square to every hundred cubic feet.

I may say here that nothing is more odious in a room, nor that gives a more dismal effect than having a central pier, but this is intensified when there are only two windows with a wide pier between them. No one, much less an architect, would ever think of perpetrating such an abomination if he were free, but architects of a former generation would sacrifice anything to their notions of propriety in a front; and if there were three windows on the first-floor, it was supposed to be necessary to have two below of the same width, the door taking the place of the third. There is a little Renaissance house at Orleans, where this case is properly treated, and we know from the Ca d'Oro at Venice, of Medieval days, that the Frenchmen, Bon, who did it, was not so affected by symmetry as to spoil his building. Subsequently Cicognara,\* who lived in the symmetrical period, added in his illustration another wing, and Fergusson copied it in his history of Architecture; Signor Boni having shown that it never could have existed, as there was a canal there.

I have been amused by two rooms built for painters, one by an eminent deceased architect, which was only lit by a square bay at one angle of the room, so that no picture could be seen except on the chimney breast; the other was a long room with the best light at the end, but the two sides were both pierced with two or three windows as well, so that no picture could be seen except by artificial light.

The exact ratio of the area of efficient light from a skylight to the cubic contents of a room has, as far as I know, never been obtained in this country; though there is a rough rule that if the skylight opening be half the area of the floor it will light a picture gallery. In the case of the Pantheon at Rome, the square foot lights 3,380 cubic feet, and in summer time lights it efficiently, but it does not well light it on a wet day in November, and the light of Italy is much more powerful than that of England.

Some artists object to picture-galleries lit by skylights, affirming that the light from the zenith is too blue. They therefore prefer vertical lights. There is one great advantage in windows, that the light can always be tempered by thin blinds, or be excluded by curtains, without the unsightly bagging of horizontal blinds—which, too, in

London, are always full of blacks. What a vision does not this call up, of an upper story being added to many of our picture-galleries and museums, when sufficient light is to be got to light the present galleries by windows.

Mr. Brett has written a paper on lighting, expressed with his usual acuteness, and mainly for the lighting of pictures. With his accustomed kindness, he has allowed me to use this paper, though it would be much better for you to read it yourselves and enjoy the pungency of his style and the information he sows broadcast. In speaking of vertical lights or windows, he says:—

"The daylight under which pictures can be well seen may be either direct or reflected; if direct it should not fall normal to the surface. It may come from the right or the left or from the top, but it must not come from behind the spectators, for two simple reasons. The first reason is that his own shadow will fall on the field of view, and the second that the surface of the picture will shine, so that the wall opposite the window is not a picture wall.

The aspect of the window is not of much consequence, for although direct sunshine kills delicate colour and is not adapted to show anything well, it can generally be diffused sufficiently for most purposes by a blind of fine texture. . . . The fundamental consideration and root of the whole art of lighting depends on having only one single aperture in the wall, so that the direct rays may all enter parallel, and not in conflicting directions.

Let us suppose you have to draw a portrait. A single high light on the head involves a shade in exact proportion to it, which you, as a draughtsman, can supply without any chance of error. The cast shadow likewise will have a known, well-defined and inevitable relation to the shade. This simplicity of light and dark enables you easily to grasp the form, and to appreciate its undulations without uncertainty or confusion, whereas, if you have two sources of light, allowing rays to enter in two different directions, not only will you get on your model two high lights in inconvenient rivalry, but all your shades will be complicated and put out of their normal relation to their lights."

On the subject of cross-lighting he says:—

"If the entrance is opposite one of the windows, as it probably must be, the effect of the light in your eyes is to contract the pupils, and to enable you to utilise only about half the light. The ordinary tenant of a town-house hankers after more light, and his architect desperately endeavours to satisfy him, by putting in more windows in another wall, too often overlooking the radical fact that the more light you let into your eyes the less you can see. For instance, it is only when you are kept in deep shade that you can see the stars, although they shine quite as bright in the daytime as at night. When two of your walls are filled with windows, letting in cross-lights, although you have doubled the area of glass, one half of the light is efficiently preventing you from using the other half, since it contracts the pupil of the eye, and floods the retina with diffused light, without revealing the objects you want to see."

Lucretius had observed this, for he says:—

"How hates the eyeball every gaudy glare;  
How darkens in the sun when poured direct.  
Lucret., lib. 4, line, 343-4.

It is a very common thing to put ground glass in a horizontal frame under a skylight or lantern; a large quantity of the light is lost by diffusion. But that is not the worst fault. In London, a few days' dust obscures half the light, and if it be left for a quarterly cleaning, you have little beyond a mere glimmer.

One great advantage of making your windows in due proportion to the space they have to light is to give variously-sized windows which tell something of the rooms they light, and give variety and scale to the building. I may point to the Spinelli Palace at Venice as an illustration.

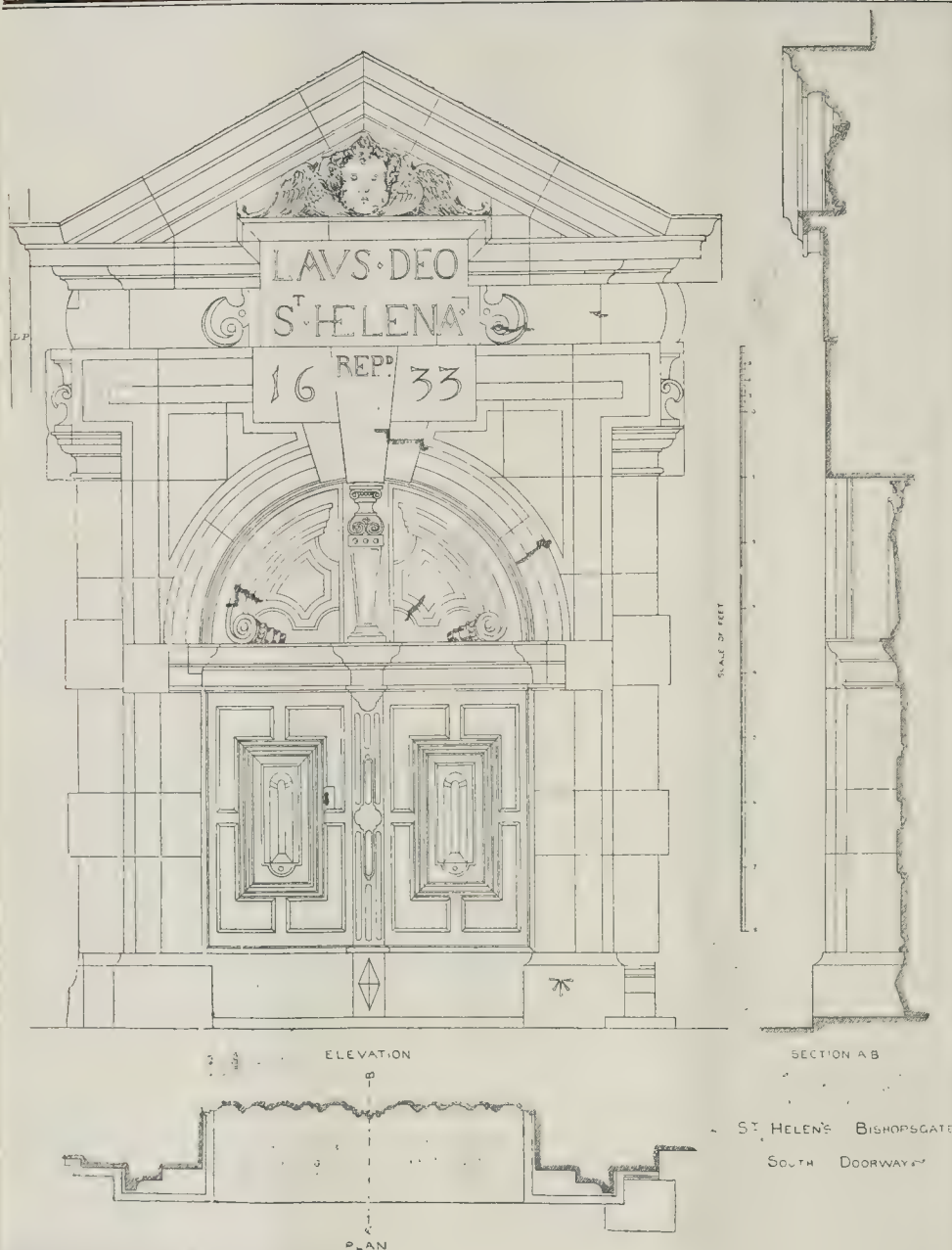
All the remaining parts of the outside are the chimneys, the balustrade, the balconies, and the cornice.

To begin with the last, if a sloped roof is to be used, you want a cornice to prevent the snow, rain, or loose tiles falling on to people's heads.

It may be said that a cornice is not wanted, but only a parapet; but if you use a parapet, the gutter is either on the wall or inside it, and as all gutters sooner or later leak and overflow, it is necessary to prevent the water running through the building or into the wall. To do this you want a cornice to take the gutters clear of the walls, and these gutters should be defended by a parapet or a balustrade, to protect those cleaning or repairing

\* Cicognara, Diedo, and Selvax: Fabbriche di Venezia.





Measured and Drawn by Mr. H. T. Bromley.

the gutters from falling. Such a cornice may be got by corbelling over, but it is better if it be supported on corbels, for the weight of the roof is ample to keep down the tails of the corbels, even when weighted on their outer ends with a parapet, which, as a rule, should be a pierced balustrade.

Hitherto no serious attention has been paid to chimneys, or we should hardly see London disfigured by crows, tallboys, and every sort of contrivance for making the chimneys draw, and every one of those contrivances is an object-lesson in ugliness and deformity. In some places they are so thick they look like the wood in Dante's "Inferno":—

"No verdant leaves, but grisly-hued are there;  
No glossy boughs, but gnar'd with many a knare;  
No fruits, but only poison-galls it yields."  
"Inferno," canto xiii., l. 4 to 6. Musgrave's Transl.

I believe what little knowledge of the subject there is, is carefully concealed as a trade secret, yet furnace chimneys tell us something—they tell us that a certain area is wanted to take off the smoke, and a certain height to obtain a draught. In a house it is obvious that if the kitchen flue draws, the kitchen being mostly in the basement, the attic chimneys, which are about one-fifth of the length, will probably smoke. We know, too, that if the top of the chimney is not carried up to about 5 ft. above the ridge, it will smoke, and

that is on the supposition that there is no obstruction near, higher than the ridge. We know, too, that a high wind does blow down the chimney, as we have the chimney-boards blown out into our bedrooms. The doctoring of chimneys is a regular trade in Italy, though I cannot speak well of the chimneys there, for they mostly smoke; yet the chimney doctor must do some good, or he could not get his living. The doctor makes his chimney-tops of tiles, and he calls them safe against two, three, or all winds, the last being octagonal, covered at the top, and with a projecting tile against each outlet. I do not know how the sweeping is managed, but the fuel is wood, which makes very little soot in comparison with coal.

It seems worth while for the whole profession to combine to have some experiments made on a tall house with chimneys carried up like a tower in stages. There are only a few things to be said about the fireplace: there must be enough fresh air let in there to supply the fire, for if the room is kept tightly closed air will be drawn down the flue to supply the fire, and there must not be too much space between the fire and the mantel, nor the sides of the fire.

A balcony is not a bad thing if we have a garden or a prospect to look at, and a fine day; occasionally it is agreeable in a street, if you want to address the mob, to see a fight or a procession, and it is admirable for catching cold in at an evening party; but unless you go down to it by a flight of steps it spoils the appearance of all the windows behind it.

In Venice, that city of balconies, there were constant processions on the wider canals that were lined with palaces, and the water and its reflections alone form a lovely picture to look at.

Parapets or balustrades are necessary where there are flat roofs, not only to prevent persons falling off, but to give the real scale of man to a building; cannot commend those gigantic balustrades that are put up as a finish to a front, as they destroy the scale of the building, nor those of ordinary size used to hide mean roofs, that are perched up so high that when you are in the gutter the bottom of the balustrade is level with the crown of your hat.

#### DOORWAY, ST. HELEN'S, BISHOPS-GATE.

THE south doorway of St. Helen's, Bishops-gate is well known to most of our readers, being one of the numerous interesting details of this old church.

This doorway, which has a richly-carved wooden vestibule attached to it, leads into the middle of the south side of the nave, and was inserted between the years 1631 and 1633, when extensive repairs were made to the church under the superintendence of Inigo Jones.

The illustration is from a measured drawing by Mr. H. T. Bromley.

#### THE ARCHITECTURAL ASSOCIATION:

##### PARTY WALLS AND PARTY STRUCTURES.

THE ordinary fortnightly meeting of this association was held on the 2nd inst. in the Meeting Room of the Royal Institute of British Architects, 9, Conduit-street, Regent-street, the president, Mr. E. W. Mountford, in the chair.

The minutes of the previous meeting having been read and confirmed, the President proposed the name of Mr. G. H. Fellowes Pryne to fill the vacancy on the Committee caused by the resignation of Mr. H. O. Cresswell.

The following gentlemen were elected members of the Association:—Messrs. C. H. Havers and H. K. Loos.

The President said that there was one matter which he wished to refer to in connexion with Mr. Crace's Colour class. At present one meeting had been held and only three members attended. Unless there were a better attendance at the next meeting the committee considered it was not fair to ask Mr. Crace to continue the class. He hoped that between then and the next occasion on which he class met they would have a considerable number of fresh members so that they would have no reason to give up Mr. Crace's course of lectures and instruction.

Mr. E. Woodthorpe, M.A., then read a paper "On Party Walls," which was as follows:—

Mr. President and Fellow Members of the Architectural Association,—It is with considerable confidence I approach this subject to-night, one so full of interest to many of us, and one that contains so many points and questions upon which we seem to be very considerable difference of opinion among architects, surveyors, and lawyers (including even judges).

The subject is such a very wide one that I have not at all absolutely impossible to give in this paper anything like a full account of the many cases that are well worthy of consideration and likely to arise.

My chief reason for choosing this subject was, at I thought it would be one likely to raise a good discussion; and it is most essential on questions of this kind to have as many different opinions as possible.

It is also necessary for every architect practising in London to know something about this question and the necessary procedure thereon.

Remembering that the majority of my listeners are probably either engaged in practice in London, or likely to be so engaged in the future, I have treated the question mainly from a London point of view, and propose to divide the paper under five heads, as follows:—

1.—The ancient statutes made from time to time, now repealed.

2.—What is a party wall? (Illustrated by cases).

3.—The statutes and enactments now in force regulating party structures in London mainly those that treat of the rights of building and adjoining owners; at the same time giving notes of some of the many superior court decisions which affect the subject.

4.—The usual procedure.

5.—The Bill to consolidate and amend the enactments relating to streets and buildings in London to be introduced by the London County Council as a private Bill, in this next session of Parliament, so far as it affects the rights of building and adjoining owners.

##### 1.—Some of the Ancient Statutes.

I think it might be interesting to some of you, to hear a few of the earliest enactments that affected this question, so, by way of introduction, I propose to take you back to the first record, that I have been able to trace, of any enactment concerning party walls:—

In the year 1189, in the time of Henry Fitz Alwyn, the first mayor of the city. "One great thing done in the time of this first mayor was about settling laws and orders for buildings in the City. And there still remains in the books of the chamber the order how to proceed in the assize concerning buildings between neighbours."

It was provided and ordained by the discreeter men of the City, to appease contentions which might arise among neighbours in the City, upon inclosure between land and land; that twelve men, aldermen of the City, should be chosen in full huestunge, and there sworn that they would faithfully perform it, and come at the mayor's summons, unless hindered by some reasonable cause, and to be present with the mayor for executing the foresaid business. "By these sworn men, orders were taken about party walls, and about building them sixteen 'foot,' at least, in height, and three 'foot' in breadth, and to build them of stone for security against fire; and, concerning gutters, to receive and convey the water from their houses—all to be at common cost. Also concerning digging pits for water; concerning making windows 'upon' the neighbours; concerning putting corbels, i.e., girders or beams, into the neighbour's wall," &c.

Note the curious meaning here of corbels, and also the expression "windows upon neighbours," meaning, I take it, ancient lights.

It does not seem that this enactment, as to having party walls of stone three "foot" in breadth and sixteen foot high for security against fire, was very strictly enforced, otherwise we should not hear of the divisions of timber that existed before the fire of London.

The next records I can find of enactments concerning buildings were in the reign of Elizabeth, and contained, in a strict proclamation, to prevent overcrowding of buildings and to abate the "embatling" of houses, yet to small effect; but there is no mention of any party division walls, though there were commissions granted "for the suppressing of hedges, ditches, and other such enclosures, to the hindrance of artillery, though the owners of the land were tenants in fee simple."

There was also a proclamation in the second year of James I., in 1605, forbidding all increase of new buildings within the City and one mile thereof, and likewise commanding all persons henceforward to build their forefronts and windows either of brick or stone, as well for decency, as by reason all great and well-grown woods were much spent and wasted (as timber for shipping waxed scarce). But this also had little effect.

From this time began the new reformation of building, although it does not appear to have had much effect in preventing the spread of fire and it seems apparent that any enactments that were in force to divide neighbouring buildings by walls, had been allowed, by not being enforced, to lapse, as I can trace nothing else on the subject until after the Fire of London, though there was another Act in the year 1656 against overcrowding buildings outside the city, part of which I quote:—

In the year 1656 an Act was made for the preventing of the multiplicity of buildings in and about the suburbs within ten miles thereof,

The preamble sets forth how these new buildings, outhouses, and cottages were found to be mischievous and inconvenient and a great annoyance and nuisance.

This enacted that for every dwelling-house, outhouse, &c., erected at any place within ten miles of the wall of the City and not having four acres of land at least there should be paid one year's rent at the full and improved wrack rent.

And all that should after this build any house or cottage within ten miles should forfeit the entire sum of 100*l.* and 20*l.* per month so long as such house should be continued.

After the fire in 1667 there was a long Act of Parliament for rebuilding the City, to carry out the enactments the Lord Mayor and Court of Aldermen nominated and appointed discreet and intelligent persons in the art of building to be surveyor or supervisors, to whom an oath was administered for the true and impartial execution of their office.

This Act set forth that "There shall be party walls and party piers set out equally, on either builder's ground, to be built upon by the first beginner of such building, and that no man be permitted to build on the said party wall, or on his own continuous ground, until he hath fully reimbursed the said first builder, the full moiety of the charges of the said party wall and piers, together with interest at 6 p.c., to be accounted from the beginning of the said first building."

The party walls by this Act were made thicker than the external walls. This Act also provided "That the surveyors shall take care for the equal setting out, of all party walls and piers, and no person be permitted to build, until that be done, and the builder was required to pay to the Chamber of London 6*s.* 8*d.* before the foundation was laid."

At the same time the Common Council made regulations against fire: some of these are very quaint. I will read one: "That every Alderman who hath passed the office of Shrievalty provide 24 buckets and one hand squirt of brass, and those who have not been sheriffs 12 buckets and a hand squirt, to be kept in their respective dwellings; and every other person, being a subsidy man, to keep in their houses a certain number of buckets according to their quality," and every man in case of alarm of fire had to turn out to his door with a bucket full of water ready to hand.

The next Act dealing with party walls was in the 6th year of Queen Anne, and made the regulations more stringent; and in the following year, the 7th of Queen Anne, a further Act was passed enacting that "the party walls were to be wholly of brick or stone, except door cases windows, lintels, &c., and be built 'nine inches on each man's ground,' and giving the first builder power to pull down the old wall, whether it was of brick, stone, or timber, and build a new wall, the owner of the next house paying for same at the rate of 5*l.* per rod.

Next we come to the Act of the 11th year of George I., in which it is provided that, "if any person refuse or neglect to build his share of a party wall after due notice given him, his next neighbour may build it for him, and oblige the person so neglecting it to pay the charges of rebuilding."

A three months' notice is required by this Act, when the parties cannot or will not agree, and each party, after notice, was required to appoint two workmen (instead of, as now, one surveyor), to say whether the wall was a sufficient or sound wall; but it was sometimes found difficult to get the workmen to agree, and so in a further Act in the thirty-third year of George II., provision was made for a fifth "able workman" to be called in.

However, this method was not found to work well.

A further Act was passed in the sixth year of George III., which enacted "that any person who shall build next adjoining thereto, and make use of the party wall thereof, shall pay to the person or persons who hath the property in such wall, one-half of the value of such wall, or of so much thereof as such person shall make use of, to be estimated and determined by two indifferent persons."

I might remark here that it seems to me a matter of regret that this provision has not been handed down to us and included in the present Act.

A further Act was passed in the twelfth year of George III. to consolidate the previous Acts as to party walls. It enacted that they should be still built half on each owner's soil, but their thickness was to be "according to the cost of the houses." This seems rather a curious regulation.

The next Act was in the fourteenth year of George III., and repealed the last Act.



In this Act buildings were divided into seven classes, and iron doors were first required to openings in party walls.

This Act was repealed in 1844.

Now we come to the 1844 Act, the last one no longer in force.

I cannot help thinking there are several enactments of this Act that had been better inserted in the 1855 Act: for instance, in Section xxviii. (that dealt with damage arising from the erection of an external wall *against* a party wall), the building owner had certain rights to excavate the ground against the party wall, but only on condition that he underpinned the party wall; and in Section xxxi. the building owner had a right to raise the party and the external walls and chimneys; but if at any time the adjoining owner wished to make use of any portion of the part so raised, it was lawful for the owner of the premises so first raised to recover the cost of a proportionate part of the portion so used together with such parts of the chimney stacks. This seems a very fair and necessary regulation, and was contained in many of the old enactments, but for some reason or other omitted from the present Act.

This Act of 1844 assigned to the official referees and district surveyors the parts now taken by the one, two, or three surveyors.

In certain cases it also allowed "reasonable compensation" for any loss which the adjoining owner suffered by reason of the work of the building owner.

It also gave a right to the adjoining owner of land abutting on other premises for further protecting his interest, where the building owner opened windows abutting on the adjoining owner's ground; to serve notice on the building owner calling on him to stop up these windows; if the building owner failed to comply, then the adjoining owner had the right to brick them up himself, and recover the costs of same.

I have always understood from architects who practised under this Act, that except in some few instances it worked fairly well; and the official referees formed an excellent tribunal which I hope some day to see restored in the form of a special court. It has been inserted in the proposed Bill.

## 2.—What is a Party Wall?

The definition of party wall given in the Metropolitan Buildings Act, as you all know, is as follows:—

"Party wall" shall apply to every wall used, or built in order to be used, as a separation of any building from any other building, with a view to the same being occupied by different persons.

The first point that strikes one about this definition is that it gives an adjoining owner a right of user of a wall that has been erected by the building owner by his placing a building against such wall, if it is allowed to remain, he, the adjoining owner, acquires a right of enclosure, and the building owner will find it very difficult to get rid of this right.

An acquired right of this kind cannot be too carefully guarded against in the first instance; for by the judgment of *Angus v. Dalton*, which is a House of Lords case, "after twenty years' uninterrupted user of support, if it be open and not surreptitious, by the Prescription Act the owner of the dominant tenement is given the indefeasible right of support for his building from the land and building of the servient tenement."

I will explain shortly a case by an illustration.

A has a house, bounded on one side by an external wall, *x, x*, built entirely on A's land, and in this wall A has windows above the ground-floor which have existed for over twenty years. B one day erects a lean-to building that does not affect any lights or injure in any way A's wall *x, x*. After twenty years, B acquires a right of user and enclosure in A's wall, and, therefore, practically, he acquires a small slice of land. This really might be the effect of the doctrine in the case of *Angus v. Dalton*.

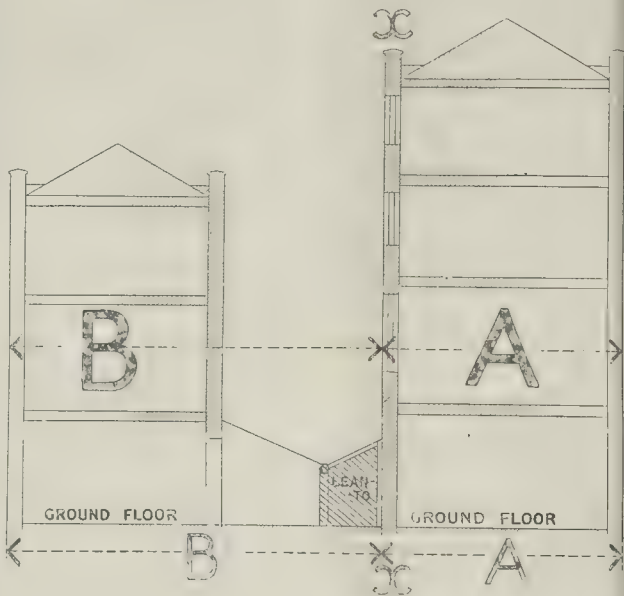
A's only remedy, it seems to me, in the first instance, being either to restrain the adjoining owner by an injunction (which would be difficult to obtain, as the wall has not been interfered with, or in any way damaged), or to pull down his own wall (which of course would be absurd) so as to prevent the right being obtained.

Several cases similar to this have come to my knowledge, and the losing, practically, a slice of land might not, perhaps, be A's only hardship. Suppose, for instance, A wishes to pull down his building and rebuild. Section, xvii. of the Metropolitan Buildings Act says: "And every party wall shall be carried up above any part of any roof opposite thereto and within four feet from such

party wall;" and Section xiii.: "But no opening shall be made in any party wall except in accordance with the rules of this Act."

If these sections are to be read literally, A will be debarred from having any windows in his own wall, as now it has become a party wall, under the definition in the Statute.

ing rights of light, was condemned as a party wall under the local Acts, on proceedings taken by the owner of the lights, and ordered to be rebuilt. The Acts contain provision that there shall be no openings in party walls of new or re-erected buildings, except iron doors for communication between the separate buildings.



This is a case that I am inclined to think sometimes arises in this way: A, perhaps, is a neighbourly man, and on good terms with his neighbour, and is not to his knowledge in any way interfered with by the lean-to put up by B, nor does he understand the rights he may lose, and probably does not even know that B has not a wall of his own inside under his roof, and the difficulties do not arise until A wishes to take down his building and rebuild.

Now the question we have to consider in respect of this wall is, first, Has the upper part above the lean-to—namely, that part that encloses A's building—become a party wall? It certainly does not separate two buildings at this point, and is entirely built by A on his own land.

I think that the well-known case of *Weston v. Arnold*, though a Bristol case, must apply to a case of this sort in the Metropolis. In that case it was held that where a wall for a few feet from the ground was the dividing wall between two houses, and above that was the outside wall of one of them, the lower part might be a "party wall," and the upper part was not.

A wall might be a party wall within the meaning of the Bristol Improvement Acts, 1840 and 1847, for part of its length or height, and an external wall for the remainder of its length or height.

There is another case—namely, that of *Knight v. Parsell*—and it was there held that "so far as the buildings extended on both sides of the wall it was a party wall within this Act," namely, the Metropolitan Buildings Act.

Now how are we to answer the question—Is the upper part above the lean-to a party wall?

I think in the face of the Bristol case, which, though a local case, interpreted Acts which contained provisions somewhat similar to the clauses in the Metropolitan Buildings Act—namely, that there should be no openings in the party walls except under certain conditions—and in the face of *Knight v. Parsell*, and after reading the definitions of party wall, I should say, No, the upper part is not a party wall, but an external wall that is, of course, from 15 inches above the top of the lean-to upwards.

The second question is, Can A have his windows again?

I think so, certainly. The Bristol case of *Weston v. Arnold* again helps us here.

A wall in Bristol separating buildings, but having in it, above the buildings, windows enjoy-

ing rights of light, was condemned as a party wall under the local Acts, on proceedings taken by the owner of the lights, and ordered to be rebuilt. The Acts contain provision that there shall be no openings in party walls of new or re-erected buildings, except iron doors for communication between the separate buildings.

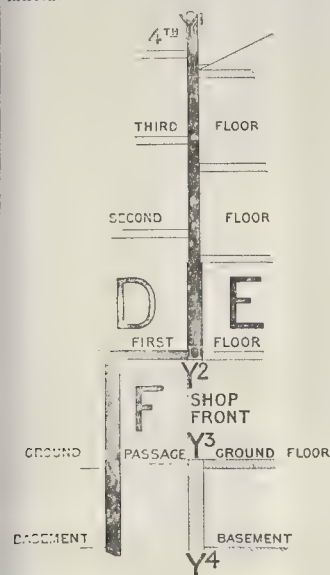
This view also seems to me to agree with the definition of party wall, namely, a wall used as a separation of any building from any other building. I do not think anyone could say that that portion of the wall, *x, x*, some 40 feet above the lean-to building was a separation between two buildings.

Either we must accept in London the Bristol case or Sections xiii. xvii.; and definition of party wall cannot always be complied with literally without great injustice.

I will give another example while we are considering this question of what is a party wall.

Y<sup>1</sup> Y<sup>2</sup> is a party wall separating two buildings, belonging to E and D, and supported on girders, stanchions, and piers. F is a public passage at ground floor, F has a shop front between Y<sup>2</sup> and Y<sup>1</sup> next public passage; D takes his building down, and wishes to erect a higher building. The party wall Y<sup>1</sup> Y<sup>2</sup> is insufficient in thickness and strength for the greater height and weight, and the stanchions and foundations that are in E's building are insufficient in strength for carrying the greater weight to be placed on them. E objects to have his ground floor or shop front or his basement interfered with at all. D has a right to take down the party wall if insufficient, but of course he must go through the proper procedure; but has he a right to go into E's premises and build up sufficient piers and stanchions to carry the extra weight he proposes to place on them? I think not, without E's consent, and probably E would not allow him to do so without adequate compensa-

tion, as I do not think it could be maintained that the lower part is a part of the party wall, though there is certainly a right of support thereon.



This is a very difficult case, and one which I do not think the Act provides for, and the only way in my opinion to arrive at a satisfactory settlement would be to place the whole matter, including the easement of support from the external part below first floor, before the third surveyor, and for the two surveyors to abide by his decision on the whole case, and to agree to sign the award; but even then the award might not be altogether in accordance with the Act, and if either D or E did not agree to it, it might be upset.

While we are on the question of what is a party wall, I shall read what Mr. Justice Fry said in the case of *Watson v. Gray*, which was a Middlebrough case: "As to the meaning of 'party wall' in a conveyance, it has a meaning 'rather popular than legal.'" He goes on to say, the word "party-wall" may be used in four different senses:—

1. A wall of which the two adjoining owners are tenants in common; this is the most common and the primary meaning of the term.
2. A wall divided longitudinally into two strips, one belonging to each of the adjoining owners.
3. A wall which belongs entirely to one of the adjoining owners, but is subject to an easement in the other to have it maintained as a dividing wall between the tenements.
4. A wall divided longitudinally into two moieties, each moiety being subject to a cross easement in favour of the owner of the other moiety.

As this case was a Middlebrough case, and does not affect us here in London very much, except so far as party fence-walls are concerned, I do not intend to go very deeply into it, but if any one wishes to see the case, he will find it fully reported in Professor Banister Fletcher's book. Shortly it was this:—

The plaintiff occupied a house; the defendant occupied another house adjoining. The yards adjoined at the rear. The plaintiff erected a shed against the wall, and raised the wall between the yards. The defendant knocked down with a hammer the raised portion of the wall. The plaintiff then brought an action for damages.

Mr. Justice Fry said: "I am of opinion that the wall in this case belongs to the plaintiff and defendant as tenants in common; either tenant might have wished to train fruit trees there, or to amuse himself by running along the top of the wall," so the defendant was quite within his rights in knocking the raised portion of the wall down.

Mr. Bedells, in his able paper on the subject read before the Surveyors' Institution, gives the apt illustration of the showman Barnum, which I shall quote here. The showman Barnum and his partner had an elephant used for exhibition purposes; the partner not handing over to Barnum his half share of the profits thus arising,

Barnum threatened if he did not do so that he would shoot "his half" of the elephant. There he was wrong, as he could not kill his half without injuring his partner's half, and, therefore, wronging him.

So it is with a party wall; the owner on one side, if he damages the wall, though on his own side, injures the enclosing wall of his neighbour's house, and therefore it is only right and necessary that he should be restrained by enactments from doing any injury to what is really a part of his neighbour's house.

Now we come to "Party Structures." I must say a few words on this portion of the subject. The definition in the Statute says:—"Party structure" shall include party walls, and also partitions, arches, floors, and other structures separating buildings, stories, or rooms which belong to different owners, or which are approached by distinct staircases, or separate entrances from without.

Then we have in Section xxiv. :—Every party arch and every arch over any public way or passage, &c., shall be constructed in a certain way.

Please note the "and" here. This section and the definition of "party structure" contemplate clearly the construction of party arches.

Next we have the fourth right of the building owner in Section lxxiii.:—"In the case of buildings having rooms or stories the property of different owners intermixed, the building owner has a right to pull down such of the said rooms or stories, or any part thereof, as are not built in conformity with this Act, and the two preceding Acts, and to rebuild the same in conformity with this Act," that is, I understand it, with proper party structures of incombustible materials, in accordance with Section xxiv. And the enactment as to the expenses in Section lxxviii., namely, that the expenses "are to be borne jointly, regard being had to the use that each owner makes of such rooms or stories;" clearly by this it is supposed they still will use such rooms or stories. But then we have in Section xxvii. :—

"Every building shall be separated by external or party walls from any adjoining building."

I will illustrate an example of a party structure by a case which occurred within my own experience.

A was building owner of a house in X street. B was adjoining owner of a house in Y street. A pulls down his house and finds that B has a room on ground floor that extends right beyond the other portions; this B has owned as long as can be remembered, but there are no deeds to show where the boundaries between the two properties are.

Can it be contended that A has a right to put up the party wall and remove this portion at the ground floor and add it on to his house? I do not think so. All A has the right and would be called on to do would be to construct the floor over and under the ground story in accordance with Section xxiv., that is either with arches or an incombustible floor, though this will not be literally in accordance with Section xxvii., Rule 1. There is clearly an omission in the Act: either "party wall" should have included "party structure" in the definition, or Rule 1 of Section xxvii. should be: "Every building shall be separated by external walls or party structures from any adjoining building," as the definition of party structure includes party walls, but it is quite clear that party structures were contemplated by the Act, otherwise they would not be enacted for as they are.

3.—The Statutes and Enactments now in Force. The Rights of Building and Adjoining Owners.

Part 3 of the 1855 Buildings Act, Section lxxiii. explains that the building owner is the owner of premises adjoining a party structure, who is desirous of executing any work, to a party structure; the owner of the premises on the other side, being called the adjoining owner.

As to who is an owner under the Act. The definition in the statute is as follows:—

"Owner" shall apply to every person in possession or receipt, either of the whole, or of any part of the rents or profits of any land, or tenement, or in the occupation of such land or tenement, other than as a tenant from year to year, or for any less term, or as a tenant at will."

There are many Superior Court decisions on this subject, but I only propose to touch upon a few:—

In *Hunt v. Harris*, the Judges (Chief Justice Earle, Justice Byles, and Justice Smith) decided that the owner responsible for the payment of his share of a wall that was rebuilt, after having been condemned as a dangerous structure, was the

beneficial owner, who held a long lease of certain premises, and not his underlessees, but it was remarked by Mr. Justice Smith that it was expedient to deal with each case as it arose.

In *Filtingham v. Wood*, Mr. Justice Chitty decided that it was necessary to serve party-wall notices on every underlessee, whose term was greater than that of a tenant from year to year. It will be seen by these two decisions, that it is necessary to serve underlessees with separate notices, though in the case of a dangerous wall which has been condemned, they may not be responsible for the cost of rebuilding.

In the case of *Cubitt v. Porter*, it was held that in the absence of evidence of ownership of a party-wall, which is included in "party structure," a jury is entitled to find that it is owned by the adjoining proprietors as tenants in common. But in the *Standard Bank of Africa v. Stokes*, whatever the rights at common law in the case of buildings under the Act, such a right no longer exists, but the right depends upon the Act itself. This is a very important decision, and shows us how necessary it is to follow out strictly all the enactments.

And, again, in *Cubitt v. Porter*, the common user of a wall separating lands belonging to different owners is *prima facie* evidence that the wall and the land on which it stands belong to the owners of those adjoining lands in equal moieties as tenants in common.

The general practice as far as I know among architects is to serve notices on the underlessees, and in certain cases to receive contribution from them.

Section lxxxiii. gives the rights of the building owner.

Section lxxxviii. enacts how the expenses shall be apportioned.

I think, perhaps, it will be best to read these sections together.

The building owner shall have the following rights:—

1. To make good or repair any party structure that is defective or out of repair, and the costs in such case shall be borne by the building owner and adjoining owner in due proportions, regard being had to the use each makes of the structure.

2. To pull down and rebuild where so far defective or out of repair as to be necessary or desirable, and the expense shall be borne jointly, regard being had to the use each makes of the structure.

3. A right to pull down any timber or other partition that is not in conformity with this Act, or with the two preceding Acts, and to build a party-wall, each owner bearing his due proportion of the cost, regard being had to the use he makes of the structure, and also to the thickness required by each building.

4. In the case of buildings having rooms or stories, the property of different owners intermixed, a right to pull down such of the said rooms or stories not in conformity with this Act and the two previous Acts and to make conformable, the cost to be divided, regard being had to the use each owner makes of such rooms or stories.

5. To pull down irregular arches over passages belonging to other persons on the same terms as to costs.

6. A right to raise any party structure permitted by this Act to be raised or any external wall built against such party structure on condition of making good all damage to adjoining owners' premises or to internal decorations, and on condition of carrying up to the requisite height all chimneys of the adjoining owner on or against any such party structure or external wall.

The cost of all this is to be borne entirely by the building owner.

It must be remembered that this clause does not give the building owner any right to raise a structure so as to obstruct ancient lights in the adjoining premises (see *Crofts v. Haldane*) before quoted, and of course the wall must be the requisite thickness required by the statutes to allow of the extra height.

Under this section the building owner has the right to underpin. The Master of the Rolls (Jessel) in *Standard Bank of Africa v. Stokes* explained that the word "to raise" meant *inter alia* "to extend, to enlarge," and accordingly this clause allowed the extension of the wall downwards in underpinning.

In the case of *Bradbee v. Christ's Hospital* (Governors) it was held that "the defendant had no right to underpin the party wall, either partially or wholly, unless that could be done without injury to the plaintiff's house, even though it might be doubtful whether the interests of the parties were several or whether they stood in the relation of tenants in common."



I think it necessary to mention shortly a case recently decided, namely, *Williams v. Bull*.

*Williams*, the plaintiff, owned a house; after serving notice on the adjoining owner, *Bull*, the defendant, *Williams* pulled down the party-wall separating his house from the defendant *Bull*'s house. He then rebuilt the wall partly on his own land and partly on *Bull*'s land, but raised it to nearly double the height at his own expense.

In course of time the defendant *Bull* pulled down his own house and rebuilt it to a greater height, using the upper part of the wall in accordance with a party-wall notice.

The plaintiff, *Williams*, then brought an action for trespass for interfering with the upper part of the wall that he had raised, seeing that the defendant had not paid for it.

Mr. Justice Mathews gave his judgment in favour of the defendant.

It is not at all clear to me from the report I saw of the case whether there was any award in either case. I should think not, otherwise it would never have arisen. I shall only make one remark on the case, namely, that it seems to me an unfair decision and contrary to the recognised custom, but I cannot help thinking there was either some other point in the case or the action should not have been one for trespass but for the sum of money for the share of the wall built by the plaintiff and afterwards used by the defendant.

Apply this decision to the first case I illustrated of the lean-to roof, and a great injustice might be perpetrated, but every case must be considered on its own merits.

In excavating ground for building or repairs any carelessness or negligence causing or accelerating the fall of an adjoining house will give a good cause of action (*Dodd v. Holme*).

And a man who orders a work to be executed on his own premises lawful in itself, but from which, in the natural course of things, injurious consequences to his neighbour must be expected to arise, unless means are adopted by which such consequences may be prevented—is bound to see to the doing of that which is necessary to prevent the mischief; and cannot relieve himself of his responsibility by employing someone else to do what is necessary, and so prevent the act he has ordered to be done from becoming wrongful. (*Bower v. Peate*.)

Then we come to

7. Right of building owner to pull down any party structure of insufficient strength for his purpose and to rebuild the same of sufficient strength on condition of making good all damage, the whole expense, including all the damage, to be borne by the building owner.

8. A right to cut into any party structure on condition of making good all damage, the whole cost, including the damage, to be borne by him.

9. He may cut away any footing, any chimney breast, jambs, or flues projecting from any party wall, to erect an external wall against such party wall, or for any purpose, on condition of making good all damage; similarly the cost of all this must be borne by the building owner solely.

Of course, in the case of cutting down a chimney breast, provided the District Surveyor has first certified that it may be done without danger to any adjoining building in accordance with Rule of 15, Section xx., and, of course, provided that he gives another footing to the wall where cut away, either lower down by underpinning or in his own wall, otherwise he would be causing damage to the wall, and further, it would contravene the first schedule by not having proper projection of footing on either side thereof.

10. The building owner has a right to deal with the wall of an adjoining owner that overhangs his ground, on condition of making good all damage.

11. A right to perform any other necessary works.

But it must be borne in mind that unless either the consent of the adjoining owner or a proper award has been obtained, these works cannot be carried out by the building owner, even though he has given the three months' notice: I mean, if he wishes to act within the law and protect his client from hostile action.

Again referring to the case of the Standard Bank of Africa v. Stokes, such a work as underpinning, even though unattended by any danger to the wall, cannot be carried out where a difference has arisen between the building owner and the adjoining owner unless they concur in the appointment of one surveyor, except by an award as provided by Section lxxxv., Rule 7.

A building owner who pulls down a party wall is not bound to protect, by a boarding or other

wise, the rooms of the adjoining owner during such pulling down and rebuilding (*Thompson v. Hill*), only I must say this is not the usual custom.

Section lxxxiv. deals with the requisitions of the adjoining owner to the building owner, to build chimney jambs, breasts, flues, piers, or recesses.

#### 4. The Usual Procedure.

Section lxxxv. gives the rules to be observed with respect to the exercise by building and adjoining owners of their respective rights.

Rule 1 of Section lxxxv. says:—No building owner shall, except with consent of adjoining owner, or where structure is dangerous and has been condemned, exercise any right unless he has given three months' notice.

If the wall has been condemned as a dangerous structure, it would be lawful for either owner to take down the party wall without the three months' notice, but when it has been taken down the usual procedure will have to be gone through before it can be rebuilt again.

Rule 2 states that the notice must be in writing, or printed, and state the nature of the proposed work and the time at which it is proposed to be commenced.

3. That no building owner shall exercise any right to the inconvenience of adjoining owner.

5. Deals with the requisitions of the adjoining owner.

6. If either owner does not consent within fourteen days after the delivery of any notice or requisition, he shall be considered to have dissented, and a difference shall be deemed to have arisen.

7. In all cases not hereby specially provided for the building owner and adjoining owner, unless they concur in the appointment of one surveyor, they shall each appoint a surveyor, the two surveyors shall select a third surveyor, and such one or three or any two of them shall settle by their award all matters in dispute, including the costs of award. "Such one surveyor," of course, refers to the surveyor appointed by both the building owner and adjoining owner, and not the third surveyor; he, the third surveyor, is not an umpire, but only on an equal footing with the other two, although he generally has to adjudicate between them; but it must be remembered that an award signed only by him, as third surveyor, is not in accord with this Section; either one or both of the other surveyors must sign as well.

Wherever possible it is best to have the signatures of all three surveyors.

It is also necessary for the two surveyors to select a third surveyor, though it is not imperative to call him in; but it should be clearly stated in the award (which in this case, of course, would be signed by the two surveyors), that he has been selected.

I am inclined to think that if, these necessary steps were always taken, as they certainly should be, and a proper award made before any work were done to a party structure, and before, in fact, the structure were touched, an immense amount of difficulty might be saved, and it would be a very rare occurrence to have recourse to the Law Courts.

Where litigation has arisen, it will almost invariably be found that some link in the chain of this procedure has been omitted.

In the case of the Standard Bank of Africa v. Stokes, the judge said that "The Act gave the three surveyors power to determine the time and manner of doing any work, and it would be reducing the Act to an absurdity to suppose that the building owner had a right to proceed with the work until they had so determined."

In certain cases not specially provided for here—namely, where a surveyor dies or refuses to act, &c.—Section xxi. of the Amendment Act of 1882 gives the necessary procedure in the appointment of another surveyor.

8. The award by such one, three, or any two of them is conclusive, or must be appealed against within fourteen days of delivery.

9. If either owner fails to appoint a surveyor for ten days after notice has been given to make such appointment, the party giving notice may appoint.

Rules 11 and 12 relate what appellant from award is to do.

Section lxxxvi. gives power to building owner to enter premises to effect works (of course only when entitled to do so under an award).

87. Deals with security to be given by building owner if required.

89. Account of expenses must be delivered to adjoining owner within one month of completion.

90. Adjoining owner may appeal against award within one month of its delivery,

91. If adjoining owner does not appeal within one month, building owner can recover as a debt.

92. Until adjoining owner pays, the building owner is sole possessor of such structure.

93. Where building owner has incurred expenses, adjoining owner liable as a debt.

Section xciv. is an important one. It enacts that where a building owner fails to do anything, upon condition of doing which his right to execute certain works is hereby limited to arise or to make good damage within a reasonable time, he incurs a penalty not exceeding 20*l.* for each day during which such failure continues.

95. Consent how given on behalf of persons under disability.

96. Consent how given on behalf of a person not to be found.

Part IV. Deals with payment of expenses by owners.

5.—*The proposed Bill to be introduced by the London County Council so far as it affects the rights of Building and Adjoining Owners.*

A separate evening might very well be set apart for the discussion of this Bill, and to-night I shall only have time to touch upon one or two points.

By section xiv.—

A wall shall be deemed a party wall though part only of it is actually used as a party wall, in the following cases:—

(a.) When a wall is after the commencement of this Act built as a party wall in any part.

(b.) Where a wall built before or after the commencement of this Act becomes after the commencement of this Act a party wall in any part.

Practically this means that a person, by erecting surreptitiously a w.c. against his neighbour's wall, converts the whole of it into a party wall, or at any rate for 10 feet above the lower building.

Nor is there any provision to prevent any openings above that height being made in a new wall, over an adjoining owner's building. This, I think, should be guarded against.

#### Rights of Building and Adjoining Owners.

Section lxxii. is a new section altogether.

Rule 1 says:—If the building owner desires to build a party wall on the line of junction he may serve notice thereof on the adjoining owner.

Rule 2:—If the adjoining owner consents to the building of a party wall there (that is, on the line of junction), the wall shall be built half on the ground of each of the two owners.

This might be unfair. Suppose the adjoining owner wants a wall 10 feet high, and the building owner 80 feet high, the wall must either be half on each owner's ground (which would be unfair to the adjoining owner), or there must be two external walls.

Rule 3 is somewhat ambiguous. It reads:— "The expense of the building of the party wall shall be from time to time borne by the two owners, in proportion to the superficial extent thereof, which they respectively from time to time make use of."

Rule 4 says:—If the adjoining owner does not consent to the building of a party wall, the building owner must build external wall on his own ground.

Rule 5:—If the building owner wishes to build an external wall on his own ground, he may serve notice thereof on the adjoining owner.

Rule 6 reads:—"Where, in either of the cases aforesaid, the building owner proceeds to build an external wall on his own ground, he shall have a right at his own expense, at any time after the expiration of one month from the service of the notice, to place on the ground of the adjoining owner the projecting footings of the external wall, with concrete or other solid substructure thereunder, making compensation to the adjoining owner or occupier for any damage occasioned thereby."

This might be hard on the adjoining owner. Suppose adjoining owner has a one-story building only. Building owner might want wall 80 ft. high, and could put his footings and concrete right in adjoining owner's room, as sketch.

And further it reads:—

"Where an external wall is built against another external wall, or against a party wall, it shall be lawful for the District Surveyor to allow the footing of the side next such wall to be omitted." By this it would be lawful to erect a wall 80 ft. or more in height without footings on one side, if an external wall 10 ft. or even less were against it.

By Section lxxxv., Rule 1.—One month's notice



have to be given for a party fence wall, and months' notice served on the adjoining owner occupier for a party wall or party structure, and of as now, three.

Rule 2.—The building owner must board the adjoining owner's building where wall is down.

Rule 4.—A notice shall not be any good unless work is begun within six months after the date thereof. These are good regulations, and being in the present Act.

Section 8 of Section lxxv. makes it imperative on two surveyors to select a third to act as umpire, and an award must be made either by one surveyor (that is in the case where the adjoining owner and adjoining owner agree to have one surveyor), or the three surveyors, or by umpire of them, so that if a difference arises two surveyors must call in the umpire, and two cannot make the award without the umpire," as they can in the present Act.

It is of course would entail more expense and occupy more time, as now so often differences are settled by the two surveyors without having recourse to the third surveyor. I can see one or two difficulties that it arise by this arrangement; suppose the two surveyors did not agree with the umpire as to costs, they—the two—could not make the award without the umpire, but the umpire would have the power to make the award alone, though difference might be a very trivial one, and he would put his costs down at anything he liked. The present arrangement has been found to work well; why alter it?

Section lxxviii. is a new section, and deals with a case where a building owner intends to build in 10 ft. of and excavate lower than the adjoining owner's building.

Two months' notice of this shall be given to the adjoining owner.

The adjoining owner shall underpin or otherwise strengthen the adjoining owner's wall if required, the expense of this is not included in the expenses to be borne by the building owner, but by Rule 3 the building owner would have to compensate him for any inconvenience, loss, or damage.

Rule 2. If the adjoining owner or occupier serves notice that he disputes the necessity of the underpinning, a difference arises.

This Section will certainly place a rather hard case on the building owner.

The Section dealing with expenses remains as at present, except that two clauses are added for party fence walls.

The last clause of this part of the Bill is an important one, and I will read it:—"Nothing in this Act shall authorise any interference with the enjoyment of light or other easements in or relating to a party wall, or take away, abridge, or prejudice any right of any person to preserve or restore any light or other thing in or connected with a party wall in case of the party wall being down or rebuilt."

This is a good and necessary clause, and I have now come to the conclusion of this Bill. I know you will pardon its length if it is to a good discussion, and where I have gone I trust you will put me right. Several of cases I have illustrated admit of other interpretations. I can only add, I thank you sincerely for bearing with me so patiently.

Mr. Douglass Mathews, in moving a vote of thanks to Mr. Woodthorpe, said that they had heard how in former days each man had to build his own wall not less than 16 ft. in height and 12 in. in breadth. He supposed that, in a very short time, the place became very crowded indeed, and wasted space became a great disadvantage, then came about the question of party-walls how they could become beneficial. It was a mutual interest in a wall, and like a great many other mutual things it did not always happen that there was convenient or satisfactory to both parties. Of course, if they had their own way, they would be glad to build their own wall, and be independent of their neighbours, but then it did not be, and they must needs take the matter as they found it. There were very often at inconveniences, but then they could not have the advantages without the disadvantages. The wall belonged to both owners A and B, it was possible that A should profit in one case and be inconvenienced. On the other hand, in the course of time possibly B had the same advantages that A formerly had, and, therefore, it might be that although A had to build the wall it was put to expense for his own purposes, B hereafter would have the benefit of A's wall

without the inconvenience and very likely the expense to which A had been put. That had been especially the case since the recent decision in *Williams v. Bull*, where it was laid down that if A carried up his party wall to a greater height than it formerly was, that B should have the advantage of the heightened wall without paying the expense. He certainly disagreed with that. He thought that if B wished to use A's wall he ought to pay his share of the value of it at current prices. It was very difficult to speak generally on that subject because each case had so many different points. He thought that Mr. Woodthorpe rather suggested that it was reasonable that compensation should be made for any loss that might accrue to the adjoining owner by the building owner's work. That, in his (Mr. Mathews's) opinion, was opening a very wide door indeed, and he was afraid it would lead to so much difficulty and expense as to do away with the advantage of the party-wall altogether. The building owner would never know what the extent of his liabilities would be. They all knew what compensation meant, and if B had to suffer inconvenience and expense he might very likely come down on A rather heavily. He had known several cases in which there had been very great hardships indeed to adjoining owners. He agreed with what Mr. Woodthorpe said about the party-wall becoming an external wall above the roof. The only difficulty to his mind in the *Williams v. Bull* case was that the building owner A had rights over B and built partly on his ground, and it seemed hard to that extent. The matter was a very difficult one. The Bristol case had been one which had influenced the London Building Acts. As to what would constitute a party-wall; whether the mere fact of putting up a water-closet or shed at one end of it converted the whole of the wall into a party-wall, he hoped they would have some modification of that, because it happened sometimes that an external wall was used unknown to the owner, and the owner of the adjoining land, and, therefore, by a very capacious act on the part of the user a right was acquired which was of very considerable importance to the building owner. Then with reference to the party floors that had been mentioned. He hoped that in the new Act they would have something more definite with regard to party structures. It was most extraordinary, considering the difficulties that arose, how easily that part of the Act was worked. Those of them who had had much to do with that matter found that matters which were found to be extremely difficult and giving rise to a great deal of discussion in a court of law could easily be settled by three men who understood what they were talking about. A surveyor came in as an uninterested party, heard both sides and determined the case. He did not remember any case in which the award had been properly drawn where there had been any difficulty. He did not see the necessity of departing from the 1855 Act which had been found to work so well. He was quite sure that no alteration was called for, and if it were, it would, so far as he could see, lead to considerable expense, and to no purpose. He might call attention to the necessity of drawing up awards very clearly. If awards were upset, it was, generally speaking, from some carelessness in drawing up the award, or from some subject not being thoroughly considered. It was most desirable, under every circumstance, that before a party-wall was touched an award should be made. It was a very simple thing to draw up an award if they knew what the award was to attain. When it was drawn up, there it was as a document, and there was no quarrelling afterwards.

Mr. Lovegrove, in seconding the vote of thanks, said he had had to deal with some of the most difficult questions as to party-walls in London. He remembered a case where the barrister brought out the old argument about a man wishing to run along or enjoy himself on his wall. There was an ordinary party fence wall and garden, and the defendant desired to build a stable and coach-house, and for that purpose underpinned the soil, and for that he was condemned in damages and penalties in the Queen's Bench Division, because he had deprived the adjoining owner of the privilege of using the wall. He did not think that the decision in *Williams v. Bull* was a proper and just one.

Mr. Bernard Dicksee said that a wall was a party-wall whether it was between one building or two. In the new Bill it was stated that a wall built 10 ft. above the lowest roof would be a party-wall. The effect of the new Bill on diagram I would be to deprive B of a story.

Mr. W. H. White having made a few remarks,

which were almost inaudible at the reporter's table,

Mr. Thomas Blashill said with regard to the party-wall sections of the Building Acts, that he was in the case which had been so often alluded to—viz., *The Standard Bank of Africa v. Stokes*. The Master of the Rolls—Jessel—who was a man of very peculiar habits of thought, seized upon it, and, apparently, without the least premeditation, launched into the whole subject, and told them that those sections not only declared the law, but the whole law, with regard to London. He did not know whether he understood it perfectly himself, but it was a most useful thing to get to know as much about party-walls as possible, because questions upon them were always coming up, and he thought that a fair and useful knowledge on the subject was wanted in an office, and was very easily acquired. An ordinary knowledge of law would be sufficient for it. He wondered who first started the question of a horizontal party-wall. He did not find it in any Act or any book. He very often found it in his office when a gentleman came to him and wanted to do something wrong. He then called a wall a floor, and it seemed to him (Mr. Blashill) to be as ridiculous as anything could be. It was a party structure, so said the Act, and the Act told them how to deal with it. It distinctly told them in more places than one that buildings must be separated by party-walls, and not floors. He would give them a word or two of caution. In the first place the Act said that if the parties could not agree as to what was to be done—they could do without a surveyor—they could appoint one surveyor to act for them, and if they did not do that they must each appoint a surveyor, and the two surveyors were to appoint a third surveyor. He (Mr. Blashill) had never had much difficulty when he had met an architect, but there was a great deal of auctioneer in some surveyors. He had often found instances of that sort. The best way to deal with men like that was to refuse to go into the question at all before the appointment of the third surveyor. The Bristol Act had been alluded to. He remembered a case in which he was engaged, and in which that Act was rather in favour of his client. One of the most eminent solicitors in London was on his side, and he took full advantage of it in his part of the performance, but he (the solicitor) told him (Mr. Blashill) that whenever it was necessary for him to have the whole decision upset under the Bristol Act he would get it done for him. When surveyors met upon a building it was quite true that they were not arbitrators, as each was acting for the best for his client. He thought that it was better to begin with the intention of agreeing than quarrelling; it saved law expenses.

Mr. H. Chaffield Clarke said that in a London practice he thought nothing was more difficult to architects than points arising out of party-wall structures. Referring to the procedure under the Metropolitan Buildings Act, he thought that a limit should be put on the validity of a party-wall notice. They had a party notice served, and nothing was done for months on it, and then suddenly the building owner woke up and wanted to proceed. That might be hard on the adjoining owner. He thought that the intention of the Act was to give the adjoining owner notice of when the work was to be executed. Buildings, especially in the City of London, often changed hands, and it would be rather hard on any lessee, when an original notice had been served months before, not to allow it to be transferred upon due notice being given. What surprised him was how often architects proceeded without an award at all, which was, of course, perfectly informal. He thought that the first thing to do was to get the award duly signed. He thought that there was a great difficulty arising where several surveyors were appointed, and they had to make several awards on the same wall.

Mr. Langton Cole said that, referring to Mr. Woodthorpe's first example, which had been so much referred to, he should be glad if Mr. Woodthorpe would say what the proper course was for B to adopt if he wished to take advantage of the party-wall. He had a similar case in which he served a notice personally on a reverend priest of the Roman Church, who met him with much indignation and told him that his proposal was preposterous, and that he would oppose him if it cost him 1,000l. The case was ultimately arranged, because it appeared that the strip of land on which he proposed to build did not belong to his client, but was held on lease.

Mr. Huntly Gordon said that he thought that in the new Bill it was proposed that there should



be some stipulation that every building should have a staircase. There was absolutely no provision for that at the present moment.

Mr. C. Herbert Bedells, F.S.I., said that it was interesting to notice how, in the proposed new Bill to which Mr. Woodthorpe referred in section 5 of his paper, many points dealt with in Acts previous to that of 1855 were introduced. Mr. H. Chatfield Clarke had referred to the indefinite period of validity of a party-wall notice under the present Act. In the Bill the point was dealt with and a limit fixed for the work to proceed—viz., not later than six months from the service of notice. This seemed a short time, but it was a step in the right direction, and was one of the alterations he, Mr. Bedells, had suggested should be made in the law in the course of a paper he read before the Surveyors' Institution, the lines of which paper had been closely followed by Mr. Woodthorpe. He (Mr. Bedells) disagreed with what had been said as to the grounds of the decision in the case of *Williams v. Bull*. After carefully investigating that case he had come to the conclusion that the real *crux* of the decision was to be found in the judge's remark that the provision in the former Act, under which the adjoining owner, when he wanted to make use of it, would have been required to pay a contribution to the cost incurred in erecting a raised party-wall, was omitted in the Act of 1855, and he, the judge, could not therefore enforce any such contribution. Mr. Woodthorpe had referred to the presumption in favour of the position of the owners in a party-wall under common law being that of tenants in common.

He, Mr. Bedells, in the paper referred to, had called attention to the fact that in one case the judges had preferred to presume ownership in severalty, with cross rights of easement, because a tenancy in common implied that either party had a right to demand a "partition." A curious case illustrating this came under his notice recently. An architect had proposed to use a party fence wall for a new building; the adjoining owner objected, and litigation followed. The judgment of the court was that nothing should be done to the wall which was inconsistent with a tenancy in common in the wall. The architect, believing he was acting within his rights, proceeded to erect the building, raising half the thickness of the party fence wall. He was immediately served with notice of proceedings to commit him for contempt of court. He therefore came to ask to be supported in an affidavit that what he had done was not inconsistent with a tenancy in common. He, Mr. Bedells, told him that, in his view, what he had done was clearly inconsistent with such a tenancy. The architect then went to a learned counsel, who confirmed the speaker's view, but found a way out of the difficulty by applying, or threatening to apply, for a "partition," the effect of which in all probability would have been that the court would have given to his client the half of the wall on which he had built as his share. This was, it would be observed, a case of a party fence wall. They had never known in London what to do in such cases, and he was, therefore, very glad to see that his suggestion to include party fence walls within the scope of the Buildings Act, and its procedure so as to give clear directions to a building owner how to deal with them, had been accepted and embodied in the Bill, and which, in this respect, deserved, he thought, the support of members of that Association. He disagreed with one of the alterations proposed—viz., that unless a single surveyor was appointed there must be three to make the award (or an award be made by the umpire). In every case of a party wall difference, however trifling, to require a third surveyor either to make or join in an award by all three seemed to him simply ridiculous.

The President then put the vote of thanks, which was carried unanimously.

Mr. Woodthorpe, in reply, said as to the question Mr. Cole asked as to what course B should take if he wanted to build, of course he could not build there because of A's lights. If anyone wanted to learn anything else on the subject he could only tell them to read a paper by Mr. Bedells on the subject, which was reported in the *Builder* in 1879. Mr. Bedells had given them a very good case and had raised a very good point. Every case, he (Mr. Woodthorpe) thought must be considered on its own merits, as they could not lay down a law covering every case.

The meeting then terminated.

ARCHITECTURAL ASSOCIATION. DISCUSSION SECTION.—The fifth meeting of the session was held at the rooms of the Association on Wednesday, Mr. C. H. Brodie in the chair, when Mr. J. C.

Stockdale read a paper entitled, "External Plaster Work." The discussion was opened by Mr. Matthew Garbutt, and continued by Messrs. Greenop, Hopkins, and White, when Mr. E. Francis Jackson, of the firm of Messrs. G. Jackson & Sons, and Messrs. H. M. Whyte, and Jno. McDonald, their representatives, gave the meeting the benefit of their practical experience.

### COMPETITIONS.

MUNICIPAL BUILDINGS, CARDIFF.—At a special meeting of the Cardiff Town-hall Committee, held in the council-chamber on the 30th ult., the Mayor (Councillor Trounce) presiding, a letter was read from Mr. Harpur, the Borough Engineer, stating that he had again gone carefully into the requirements of the various departments as set forth in the epitome dated October 3 last, in accordance with instructions of the committee of October 16 last. He found that the superficial area of the space occupied by the departments which were absolutely obliged to be situated on the ground floor, together with an allowance for corridor, lavatories, space taken up by walls, and a reasonable amount of open space for light and ventilation, was 58,548 square feet, being 13,095 square feet less than the quantity stated in his letter to the Committee of March 22 last. The total area of the lands at present owned by the Corporation, and including portions of the public footways in Westgate-street and St. Mary-street, referred to in his letter of March 22 last, was 59,753 square feet, and in addition to these figures the surplus lands, after widening Quay-street in accordance with their Parliamentary plans of the present session, exclusive of any portion of the National Provincial Bank and Griffin Hotel premises, would amount to 2,043 square feet, making a total area of 61,796 square feet. That left a margin of 3,248 square feet over the area of land required on the ground floor. Alderman Rees moved—"That, having considered the question of the site for the new municipal buildings, this committee is of opinion that the present site (including the sites to be acquired) is sufficient for the purposes, and, provided the fire-brigade station, the police station, and the police-courts are removed to another site, it recommends the council to adopt the same." The Mayor remarked that whatever kind of municipal building was erected in Cardiff he should advocate the present site being utilised. The motion was then put and carried by six votes to four. It was also agreed—"That premiums be offered for plans and elevations for the erection of the new buildings in harmony with the above resolution as follows:—1st premium, 500l.; 2nd premium, 300l.; and 3rd premium, 100l.; and that it be made a condition of the competition that the winner of the first premium be the architect of the buildings, and that the amount of the premium be included in the commission payable to such architect."

BATH PUMP-ROOM EXTENSION.—At a meeting of the Bath Town Council held on Tuesday at the Bath Guildhall, the Town Clerk said a letter had been received from Messrs. Bagallay & Bristowe, of Conduit-street, Regent-street, complaining that they ought to have been awarded the second place and premium in this competition. The Baths Committee at their last meeting did not think that the letter should receive consideration, and the next business was proceeded with. Now he had received another letter from this firm of architects in which they said: "As our former letter does not appear to have been submitted to the Town Council, as requested, we herewith enclose a similar letter directly addressed to the Mayor and Corporation, and we trust it will be submitted to the Council itself in the usual way in order that any reply sent may be by the authority of the Council." The enclosed letter stated: "We respectfully call your attention to the fact that we are entitled to the second prize and premium in this competition. The circumstances of the case are so well known that we need now only allude to them to point out that by your recent action you have acknowledged that Mr. Davis was a disqualified competitor." Mr. Moore said the letter was considered by the Baths Committee, and they decided that they could not entertain any objection. It hinged on Mr. Jolly's resolution that although the plans should be disqualified yet the premium should go to the author, and the suggestion of the Town Clerk it was decided to inform Messrs. Bagallay & Bristowe that the Council saw no reason to deviate from the resolution of the Baths Committee.

### Illustrations.

We shall be glad, on former occasions, to make arrangements for delivering at the Royal Academy all drawings which are sent to us to be photographed for illustration in this journal before being sent to the Academy.

#### SCULPTURE: "ST. SEBASTIAN."

THIS group, submitted in competition to the artist, Mr. F. Thomas, for the Royal Academy Gold Medal in Sculpture, was not the successful design; but was the one most generally admired and valued in the opinion of many should have had the medal; and we publish an illustration of it that ground.

The full subject was "Irene and her attendant removing the body of St. Sebastian from the tree after his first martyrdom." Irene is cutting the cord, the weight of the body being supported by the male attendant, while the woman at her feet is supporting the lower limbs.

As Mr. Thomas expressed himself, in writing to us, strongly convinced of the importance of designing a group of several figures so that it should compose well from all points of view, generally admitted principle, of course, but not always acted upon—and sent us two photographs of the group, we have given them all, so as to show the composition from three points of view.

#### WALL DECORATIONS IN TILING FOR A HOSPITAL.

THESE figures, representing "Faith," "Hope," and "Charity," carried out by Messrs. Maw & Co., were originally drawn for them by Mr. Weatherstone for a redos, but have been considerably modified and the drapery rearranged by Mr. C. H. Temple, who painted them in "underglaze" on tiles for the staircase landing at the Shrewsbury Eye and Ear Hospital.

The drapery of the Faith and Hope figures in mulberry and fawn colours, that of Charity in coffee and copper tints, all lightly treated, each having a diapered background of dark olive green.

#### A DISTRICT COUNCIL HALL, BERLIN.

THE District Council Hall for the "Mark" Division of the Province of Brandenburg, which we illustrate, contains the meeting halls for both the so-called "upper" and "lower" houses of this miniature Parliament, as well as the necessary administrative offices for the honorary officers and their paid assistants. The ground-floor and first-floor plans, which are appended, explain themselves, but it may be of interest to note that the large top-lighted hall, marked E, on the ground floor, has been the scene of the more important political speeches of Emperor William II., who is much attached to the district the Council question represents.

The material used on the elevation is red freestone. The architects were Messrs. Ende and Boeckmann, whose work in Japan we had occasion to illustrate some time back.

The following table gives the names and uses of the principal rooms, which are lettered in reference to it:—

#### Ground Floor.

A.—Outer Hall.	I.—Library.
B.—Inner Hall.	J.—Secretary's Office.
C.—Lobby and Clock room.	K.—Treasury Department.
D.—Post Office.	L.—Public Office.
E.—Council Chamber.	M.—Public Gallery.
F.—Refreshment Room.	N.—Staircases.
G.—Committee Rooms.	O.—Lavatories.
H.—President's Offices.	

#### First Floor.

A.—"Privy" Council Chamber.	L.—Board of Works Office.
B.—Officers' Retiring Rooms.	M.—General Office.
C.—General Office.	N.—Lobbies.
D.—Guardians' Offices.	O.—Passages.
	P.—Staircases.
	Q.—Lavatories.

#### "THE BURY," KING'S WALDEN, HERTS.

WE this week give an illustration of the entrance front of the Bury, King's Walden, Herts, recently erected for Mr. T. F. Harrison. It was originally intended to rebuild only the kitchen wing, to put a new roof over the main portion of the house, to case the external walls and to replace the sash-windows, which did not form part of the original design, with stone mullioned ones, traces of which were found in one or two instances. On commencing the work





THE BUILDING COMPANY, 1890



W. J. W. 2200. 1. 1. 1.





The Bury  
 Kings Walden Herts.  
 For T. F. Hemson, Esq.<sup>r</sup>  
 Reesley S. Burmeister, Architect





PHOTOGRAPH BY SPRAGUE & CO. 45 EAST HARDING STREET FETTER LANE E.C.











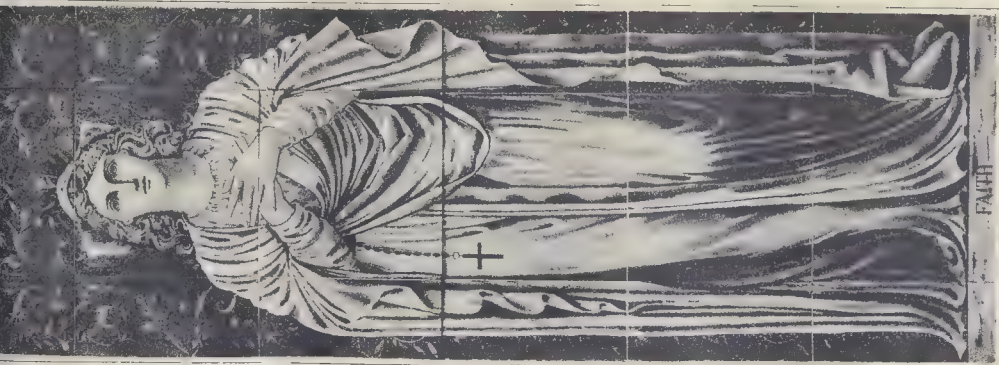
A DISTRICT COUNCIL HALL, BERLIN.—MESSRS. ENDE & BOECKMANN, ARCHITECTS  
FRONT TO MAIN STREET.





THE BUILDER, FEBRUARY 10, 1894.





WALL DECORATIONS IN TILING FOR A HOSPITAL

ADAPTED AND PAINTED FOR MESSRS. MAW & CO., BY MR. C. H. TEMPLE, FROM DESIGNS BY MR. A. C. WEATHERSTONE.







A DISTRICT COUNCIL HALL, BERLIN - MESSRS ENDE & BÖCKMANN, ARCHITECTS  
CENTRAL ENTRANCE PORTICO.





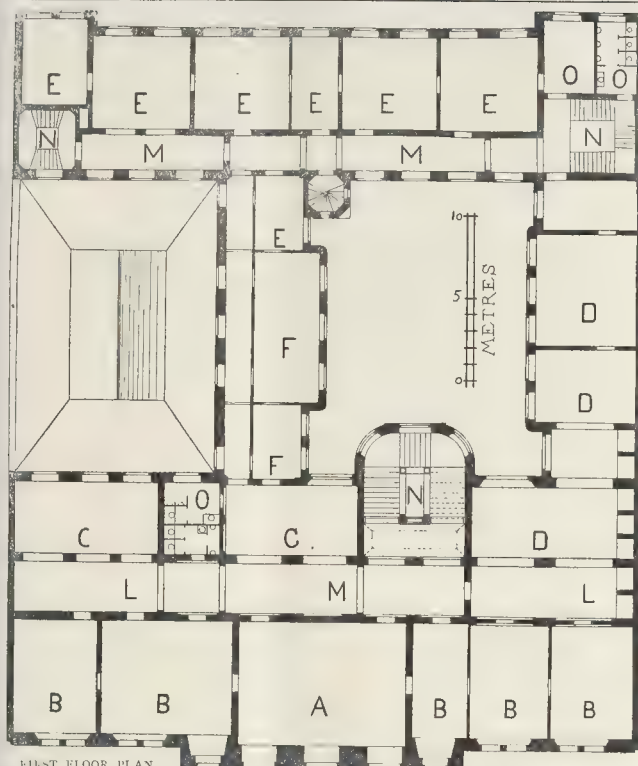


*New Porch, Higham Church, near Colchester, 1893*

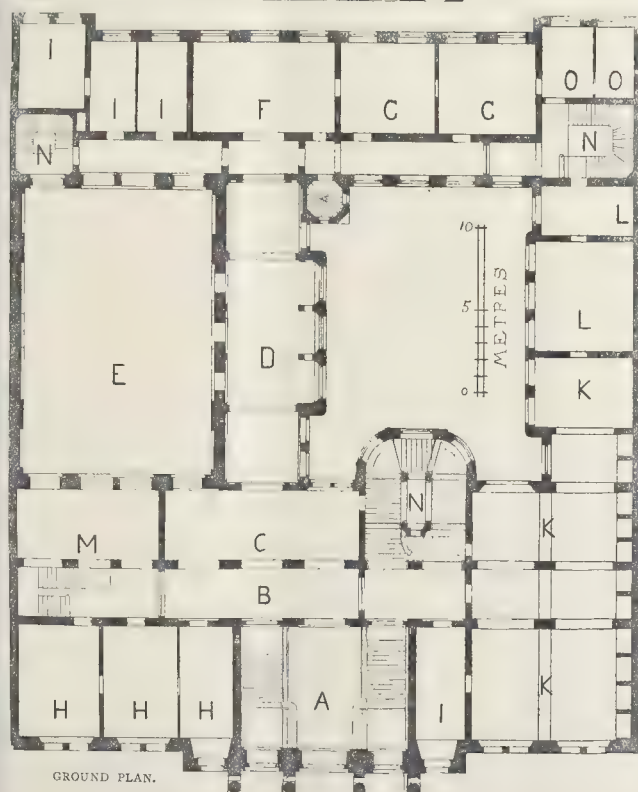
NEW PORCH, HIGHAM CHURCH, NEAR COLCHESTER. MR W H A BERRY, A.R.I.B.A., ARCHITECT.







FIRST FLOOR PLAN.



GROUND PLAN.

A District Council Hall, Berlin.—Plans.

however, it was discovered that the decay in the timbers and the unsoundness of the walls necessitated the entire rebuilding, with the exception of the main staircase, drawing-rooms, and bedrooms over, the general lines of the plan being adhered to, so that the old panelling and chimney-pieces could be reused.

The facings are of Rowland's Castle red bricks, with Messrs. Trask & Son's Douling stone dressings, and green slate roofs. Messrs. Beeston & Burmester, the architects, superintended the works. Mr. Adcock, of Dover, was the builder, Mr. George Knott acting as clerk of works. The foundations and drainage, forming a separate contract, were carried out by Messrs. Jones & Son, of Liverpool. Messrs. Burt & Potts supplied the iron casements throughout. The decorations of the principal rooms were carried out by Messrs. Gillow.

The drawing was exhibited at the Royal Academy last year. A sketch of the new stables, built under the same contract, appeared in the *Builder* of September 30, 1893.

#### BANK PREMISES AT DAVENTRY.

THE drawing illustrated shows the premises recently erected at Daventry, Northants, for the Capital and Counties Bank, Limited. The accommodation comprises banking-room, offices, strong-room, &c., and manager's residence.

Red brick and Ancaster stone are the principal materials used externally, with plain tiles for roofs.

Messrs. Kidner & Berry are the architects, and Messrs. Neal & Bosworth, of Daventry, the contractors. The drawing was in the exhibition of the Royal Academy last year.

#### NEW PORCH, HIGHAM ST. MARY, SUFFOLK.

THIS porch, the gift of Mr. Thomas S. Furniss, a parishioner, has been recently added to the church. The walls are of flint-faced rubble and Portland stone, the timber work of English oak, and the roof covered with plain tiles on oak battening and boarding.

The old wall of the church at this point being somewhat bulged, and otherwise weakened by age, it was required to construct the porch so as to act as a buttress, at the same time presenting the general character of open timber work.

Mr. W. H. Atkin Berry is the architect, and Mr. W. Wheeler, of East Bergholt, the builder. The drawing illustrated was in the Royal Academy Exhibition last year.

#### ENGINEERING SOCIETIES.

CIVIL AND MECHANICAL ENGINEERS' SOCIETY.—A paper was read before this Society on the 1st inst., by Mr. A. Fairlie Bruce, A.M. Inst. C.E., on the "Rosario Sewage Works." The author commenced his paper by stating that public attention was not forcibly drawn to the unhealthy condition of the town of Rosario, in the Argentine Republic, until the cholera outbreak of 1886 aroused attention, and that plans for a system of drainage were then prepared by Mr. Featherstonhaugh, and accepted by the authorities the following year. He then went on to describe the system adopted for the sewers, the town being divided for drainage purposes into three districts—namely, the Mendoza, Santa Fé, and Catamarca. The Mendoza section has an area of about 1,200 acres, of which 740 are drained. The main sewer is oval in shape, has a sectional area of 25 square feet, a gradient of 1 in 500, and a discharge of 7,611 cubic feet per minute, equal to one-tenth of an inch of rainfall per hour. The heaviest recorded rainfall for four years was  $3\frac{1}{2}$  in. in six hours, and only  $\frac{1}{4}$  to  $\frac{1}{2}$  of the rain reaches the drains. The sewage is discharged into the River Parana. Various interesting details were given of the work and its construction in the district just named, after which the districts of Santa Fé, and Catamarca were dealt with. Allusion was made to the foul condition that the soil was in, and the difficulties experienced in consequence, in carrying out the tunnelling work, of which there was a large quantity, many men having suffered from blood poisoning. The breakage of the iron pipes in unloading from the ships was only 1·1 per cent., and that of the stoneware pipes 2·6 per cent. Extracts were next given of reports of Sir Joseph Bazalgette and others as to the inappreciable effect of the discharge of the sewage into the River Parana. The author was the resident Engineer, and Messrs. J. G. Meiggs, Son, & Co. were the contractors.



## MAGAZINES AND REVIEWS.\*

THE most interesting article in the *Art Journal* is that which gives some account of that remarkable French sculptor, Christophe, with illustrations of some of his works, in which (notably in "Le Baiser Suprême") he combined sculptural power with the expression of deep thought in a very unusual manner. A note on "Mr. Orchardson as a Dramatist," by Mr. Walter Armstrong, draws attention to the dramatic element in that artist's work in a tone of rather too moderate appreciation of an artist who has made painting "a criticism of life," more, perhaps, than any one among his contemporaries. An article on Tlemcen and its vicinity gives some illustrations from photographs of the architectural monuments.

The *Magazine of Art* gives an illustration of Mr. Waterhouse's "La Belle Dame" as a frontispiece. Miss Postlethwaite gives an article (with portraits) on "Some Rising Artists," one or two of whom will think the adjective a doubtful compliment: and Mr. Horace Townsend writes one on H. H. Richardson, the architect, with illustrations of his buildings and a portrait of his large and genial presence. Some such influence as Richardson was wanted to shake American architecture out of its groove; but now that the shake has been given, one looks at the collective work of the shaker with a feeling that it is possible to have "something too much of this." Force there always was in Richardson's work, but refinement was rather wanting, and he repeated certain marked peculiarities too much.

The *Studio* contains, as usual, a great variety of piquant illustrations; among the subjects treated are "Pâte sur Pâte," by Mr. Solon, and "Japanese Netsukos," by Mr. E. Gilbertson. Mr. Swynnerton's design for a fountain, of which two illustrations are given, is certainly original, but seems rather boisterously so.

The *Quarterly*, under the title, "Some Theories of the Ice Age," devotes an article to a review of Sir Henry Howorth's book, "The Glacial Nightmare," in which he has attacked the glacial epoch theory, and argues that the disturbances attributed to the prevalent action of ice might much more probably be attributed to that of water. The *Quarterly* sums up in favour of Sir Henry's views, and hails him as a deliverer of mankind from the prospect of an event which would crush out all that civilisation has achieved, and leave a *tabula rasa* for a fresh start of a human race out of protozoa. An ably written article on "Betterment and Local Taxation" exposes very strongly the folly of the illogical craze, as it may be called, for "betterment" which seems to have seized upon some Municipal politicians.

The *Edinburgh Review*, in an article on "The Economy of High Wages" (mainly a review of a book under that title by Mr. Schoenof, of New York) endeavours to prove, and makes a rather remarkable case for it, that high wages and shorter hours do not mean greater but less cost of production. The main ground for this apparently paradoxical position is that the efficiency of the workman, secured by better living, is a far more important factor in production than has been generally recognised, and that more efficient work is done in proportion to the time employed, with shorter hours. Some of the statistics given in favour of this view are startling; but there seem to be two considerations omitted in the argument: 1st, how far can it be carried, and where is the point at which the advantage ceases, since it is self-evident that the argument cannot be carried *ad infinitum*; 2nd, what is likely to be the effect on the duration of human life of doing all work against time so as to make the most out of the shorter hours? This point is not even touched on. Yet when Mr. Schoenof says that English factory girls have not the nerve power to follow the high speed at which American cotton-spinning machinery is worked, surely it must be evident that the human system must pay in another way for this high tension—must wear out sooner. The remarks on the importance of healthy housing and good ventilation in enabling the artisan to do his best with his work, are admirable, and we are glad to read them. But the article, as a whole, fails to grasp the entire conditions of the problem; the reasoning stops short just where the real difficulty comes in.

To the *Contemporary* Mr. John Rae contributes

\* The object of these notes is to point out anything in the contents of the current magazines which is of special interest to our readers, with occasional brief criticisms on the views expressed in such articles. When a magazine which has been sent to us is not noticed, it is because that number contains nothing that it is within our province to comment upon.

an article on "The Eight Hours' Day and Foreign Competition," which is in the same strain as the one last referred to, arguing that the shortening of hours has not hitherto increased the cost of production, and therefore will not now; the writer apparently ignoring altogether the question of finality in the use of such an argument. At what point does the shortening of hours cease to be a gain and become a source of loss? It must do so somewhere, otherwise we should gain more by reducing labour to one hour a day; but this is a point which each writer ignores, and is innocent enough to think his reader will ignore also.

In the *Fortnightly Review* we have an article on the Employers' Liability Bill, by Mr. Vaughan Nash, written on the artisans' side of the question, and in the tone of contempt for all who can see the other side which is usual. Mr. Nash thinks the public are not aware of the frequency with which accidents happen in carrying out large works. Perhaps not; but is he aware, on the other hand, what a large percentage of these happen purely from the carelessness of the men themselves?

In the *National Review* Mr. Hugh Bell writes some common-sense, accompanied by and based on a good deal of statistics, in regard to the "Living Wage." Summing up the subject, he says, "If we heard less about the rights of labour, and more about its duties, I should feel greater confidence in the future. As long as men are taught to believe that a duty is laid on society to provide for all its members, and not that a duty rests with each individual to justify his place in the world, so long we shall have crowds of so-called 'unemployed' clamouring for the work which they will not perform when it is offered." Which is more sound sense on this subject than we have lately been accustomed to see.

The *Century* commences its number with an article on Mr. Tadema, his art, and his dwelling-house, with illustrations of the latter; an article which cannot fail to be interesting to English readers.

In *Harper's Magazine* a long illustrated article on "A Bar of Iron" (No. X. of a series on "Great American Industries") is really interesting and useful, giving a great deal of practical information in a pleasant and readable manner.

*Scraper* includes a long and appreciative article by Mr. Cosmo Monkhouse on "Edward Burne-Jones," with a number of very good illustrations from his pictures. Did *Scraper* receive a private intimation in advance of the honours destined for the painter, that the article comes so pat in at the right moment?

In the *New Review* Mr. Walter Crane concludes his picturesque and original "Impressions of America," accompanied by sketches. How America looked to Mr. Crane is a matter of more interest than his impression on the ordinary Briton. Mr. Crane is given to look at things from his own standpoint and without considering what is the correct thing to say. His comments on the way they do things in America are plain-spoken and caustic. American energy, he observes, is fitful, like the climate. "I was not impressed by any superior quickness or sharpness. I had to do with a lightning picture-hanger at Chicago. By the short and simple device of French nails he certainly got on quickly; but I found the works were apt to get hung upside down." One instance of American directness of application in a notice-board is amusing. It was on the temporary door of a boarding round an unfinished building in Chicago, and read thus—"Keep outside. This means you"; a mode of prohibition capable, in one form or other, of very wide application.

*Longman's* contains an article on "Colour," by Mr. J. G. McPherson, which is very elementary, but may be useful to "the general reader."

*Macmillan* has a fine little article by Vernon Lee on "Modern Travelling," summing up with one mystery connected with travelling, "almost too subtle for words. Do you know what it is to meet, say in some college room, or on the staircase of an English country house, or even close behind the front door in Bloomsbury, the photograph of some Florentine relief or French Cathedral, the black, gaunt Piranesi print of some Roman ruin, and to feel suddenly Florence, Rouen, Reims, or Rome, the whole of their presence distilled, as it were, into one essence of emotion"? Some of us know; and the rest, as Browning said—

"The rest, they may live and learn."

To the *Nineteenth Century* Mr. C. Whibley contributes an amusing and cleverly-written short article on "Italian Art at the New Gallery," and the Duke of Argyll a paper in which he dismisses the Glacial theory with contempt.

The *Fall Mall Magazine* includes an article on "Ten Days in the Peloponnese" by Mr. E. F. Benson, which seems framed on the principle of the advice we once heard given for becoming a popular lecturer—"Don't give people any real or useful information." Mr. Curzon's article on Bangkok (No. III. of "Strange Cities in the Far East") is much better, and includes some really good architectural illustrations.

The only thing of artistic interest in the contents of the *English Illustrated Magazine* is the frontispiece, a very good reproduction of a very charming silver-point by Mr. Sainton, entitled "Dolce far niente."

Mr. L. C. D'Oyle's article in the *Gentleman's Magazine*, on "Gas as a Sanitarian," hardly answers to its title, as it is merely an article in favour of the use of gas fires in place of coal. It is worth attention, and goes at some length into the question of the most economical use of gas for this purpose, for the poorer classes.

No. 5 of *Punch Pictures* is perhaps the best we have had yet, and introduces us once more to a good many well-remembered favourites, including one or two of the best things Leech ever did for *Punch*.

The *Antiquary* commences a new series of articles under the title "On Roads and Boundaries," by Mr. T. R. Boyle, F.S.A.

We have received the first annual issue of *The Book-plate Annual*, an illustrated periodical dealing with matters relating to the make-up and preservation of books, book-plates, &c.

## SANITARY INSPECTORS' ASSOCIATION: ANNUAL DINNER.

The eleventh annual dinner of this Association was held on Saturday last at the First Avenue Hotel, the President, Sir B. W. Richardson, occupying the chair, and amongst those present were:—Sir Thos. Crawford, Dr. Thorne Thorne, Professor Corfield, Dr. Danford Thomas, Dr. Louis C. Parkes, Dr. King Warry, Dr. Fletcher Little, Hon. and Rev. Canon Leigh, Rev. J. Diggle (Chairman, L.S.B.), Venerable Archdeacon Sinclair, Mr. H. C. Stephens, M.P., Mr. Pickersgill, M.P., and Mr. McMillan.

The first toast, after that of "The Queen and the Royal Family," was "The Church and the Ministers of all Denominations," interpolated into the programme on account of the recent institution of a "Church Sanitary Association." The Hon. and Rev. Canon Leigh, who was called upon to respond, accorded to the Rev. Mr. Lawrence the chief credit of originating the Church Sanitary Association. Sir Thos. Crawford responded to the toast of "The Army and Navy," which Dr. Danford Thomas had proposed. The medical officers of the Army had been, he said, the first to recognise the importance, from the public point of view, of a study of sanitation. Years before the question was taken up by the public, Dr. Marshall, Sir A. Martin, and Dr. Parkes had initiated sanitary reforms in the Army which had resulted in a great saving of life among soldiers, and had consequently relieved the resources of the nation by greatly lightening the drain of men into the Army. Enormous progress had been made in the knowledge of sanitary science, the processes of saving life, and of the means of making the lives of our people healthful and happy.

The "Houses of Parliament" was proposed by Mr. J. McMillan, Mr. H. C. Stephens, M.P., and Mr. Pickersgill, M.P., both responding. Mr. Stephens, in referring to the work of the present protracted session, said the eventual effect of the Parish Councils Bill would be to transfer some of the powers now possessed only by Parliament, or which were in the arbitrary control of a Government department, to parish and county councils. Under the control of such local bodies, more sympathy with local wants would be developed, and sanitation, together with many other local questions, would be placed on a firmer and sounder basis than was possible while they were under the control of an official body. By its means every parish in the country might yet be extricated from those sanitary conditions which, at present, were a disgrace.

Mr. Pickersgill, M.P., who also replied, said the House of Commons was perfectly alive to the importance of sanitation. While he had been in the House a most salutary measure of sanitation had been passed in a great Public Health Act, but that excellent measure would be useless unless it were adequately administered. The number of Sanitary Inspectors in London was disgracefully inadequate for the work they had to do, and it was precisely in those districts which most required them that Sanitary Inspectors were the fewest.



The President, in his opening speech, referred to the severe loss the Association had sustained in the deaths of their late President, Mr. Robert Dennett, and their Secretary, Mr. William Knox. He congratulated the Association on the state of its finances, which, under the able management of the Treasurer, Mr. Jos. Stevenson Jones, had so steadily improved and were now in a very satisfactory condition.



Mr. T. F. Rider, London, and Mr. Jos. Stevenson Jones, Liverpool, were elected Vice-Presidents; and Mr. Stanley G. Bird, London, Mr. R. Neill, jun., Manchester, Mr. J. Howard Colls, London, and Mr. J. C. White, Liverpool, were elected Hon. Vice-Presidents.

Mr. C. W. Green, Liverpool, was elected Hon. Treasurer, Mr. W. H. Smith, Northampton, was elected Hon. Auditor, and the following gentlemen were elected Members of the Council:—Mr. C. H. Barnsley, Birmingham; Mr. W. Sapote, Birmingham; Mr. J. Henry Marsden, Bolton; Mr. Wm. Moulson, Bradford; Mr. W. Holdis-W. Church, Bristol; Mr. Jos. Bell, Cambridge; Mr. John Walker, Derby; Mr. Thos. Bonnar, Edinburgh; Mr. R. Bennett, Glasgow; Mr. R. Bevers, Hull; Mr. C. Myers, Leeds; Mr. Banks Mawson, Leeds; Mr. Wm. Henry Close, Lincoln; Mr. Hy. E. Dallow, Liverpool; Mr. R. Stevenson Jones, Liverpool; Mr. Jno. Burt, London; Mr. Frank May, London; Mr. William Southern, Manchester; Alderman Wm. Brown, Manchester; Mr. W. H. Smith, Northampton; Mr. Enoch Hind, Nottingham; Mr. Jas. Bowden, Potteries and Newcastle; Mr. John Walsley, Preston; Mr. C. B. Holmes, Wigan.

Mr. J. A. S. Hassel, of Liverpool, who was a partner with the late Secretary, was appointed Secretary.

Various matters of special interest to the building trade were brought forward and discussed by the members, including the bearing of the case of *Temperment versus Russell* and the Hull Unions, wherein it was decided that further financial support should be accorded.

It was decided to hold the next half-yearly meeting at Bolton.

A vote of thanks to the Chairman for his services concluded the meeting.

#### ARCHITECTURAL SOCIETIES.

**LEEDS AND YORKSHIRE ARCHITECTURAL SOCIETY.**—At a meeting of members of this Society, held in the Law Institute, Leeds, on the 5th inst., Mr. G. B. Bulmer presiding, a paper entitled "Notes on Some Bavarian Towns" was read by Mr. E. Guy Dawber, of London, and illustrated by means of a series of photos and sketches. Of Rothenburg, on the Tauber, he said that few places were less spoiled by modern innovations than this town. For the painter as well as the architect there could not be a richer field. Founded in the tenth century, Rothenburg retained most of its original features, and he thought no town in Europe so impressive by reason of its Medievalism. The numerous finely-carved fountains in the streets, the wrought-iron work and beautiful window grilles he considered specially noticeable. Würzburg, with its bridge and statues, and Aschaffenburg, with its refined domestic buildings and magnificent palace, were also described. Frankfurt, he pointed out, contained some charming examples of slate-hung houses, which were well worthy of study. In conclusion, the lecturer instanced cases of old structures untouched from their commencement that bore unmistakable evidence of having been entirely plastered, and that on the sides not exposed to the weather retained the plaster intact. The bulk of the buildings, he said, were plastered, and from evidence before him were coeval with the time they were built. On the motion of Mr. Dodgshun, seconded by Mr. C. Hall, a vote of thanks was accorded to Mr. Dawber.

**CARDIFF SOCIETY OF ARCHITECTS.** The annual dinner of the Cardiff, South Wales, and Monmouthshire Society of Architects took place on the 1st inst., at the Angel Hotel, Cardiff. Mr. E. Seward, F.R.I.B.A., President of the Society, presided, and among those present were the Mayor of Cardiff (Councillor W. J. Trounce), Mr. T. Forster Brown, M.Inst.C.E.; Mr. J. M. Brydon, F.R.I.B.A. (official representative of the Council of the R.I.B.A.); and Mr. W. Harpur, M.Inst.C.E. (Cardiff County Surveyor). The President having submitted the toast of "The Queen and Royal Family," proposed "Our Pastors, Legislators, and Defenders," to which the Rev. Canon Thompson and Lieutenant W. H. D. Caple (hon. secretary) replied. Mr. T. Forster Brown, M.Inst.C.E. (President of the South Wales Institute of Engineers), then proposed "The Cardiff, South Wales, and Monmouthshire Architects Society," and said that during recent years the profession of architects had enormously improved the condition of the houses of the working classes in the matter of ventilation, sanitation, &c. Mr. J. Coates Carter then read the annual report, and the President

awarded the prizes gained in the past year's competitions. The President, in responding to the toast of "The Society," incidentally referred to the question of the new municipal buildings for Cardiff, and expressed a hope that the town would soon have buildings that would not only meet all the requirements of the town, but also add to its status and dignity. He also referred to the Society having recently entered into alliance with the Royal Institute of British Architects, as one of the Provincial Societies of Architects, by which their scope had become extended, so that they now represented an altogether wider district than Cardiff, including, in fact, the whole of South Wales and Monmouthshire. This opened up a greatly-improved status for the Society, and gave it opportunities for usefulness, which, as a merely town Society, it could not have commanded, whilst not only to them as practising architects, but to their students, several very direct and solid advantages would accrue, the chief of which he outlined. Mr. Brydon, F.R.I.B.A., in responding to the "Kindred Arts and Sciences" supported the statement of the great advantages arising from combining with the Institute, and made suggestions towards a greater community among architects, sculptors, artists, and decorators, &c. Mr. George Thomas, F.S.I., proposed "The Local Governing Bodies," with which he associated the name of the Mayor, as representing the County Council, and Mr. Lewis Williams, J.P., as representing the Cardiff School Board. In responding, the Mayor observed that there had never been a year in which there were so many important schemes under the consideration of the Corporation as this year. The Corporation were employing 600 workmen on the waterworks, and before the end of the year they would probably have 1,000 employees on that great undertaking. The Corporation would shortly be constructing new baths; the electric lighting-station was getting on rapidly; and they were also endeavouring to consolidate the interests of Cardiff in a harbour trust. Mr. Lewis Williams, J.P., also replied. Other toasts followed.

#### Correspondence.

To the Editor of THE BUILDER.

##### NONSUCH PALACE.

SIR,—The tradition to which "D. W." refers, that a doorway which he saw near Ewell originally belonged to Nonsuch Palace, would be valuable if he could establish its truth, but I am afraid it is like several other rumours about the old palace, incapable of proof.

I think there is a picture, either at Windsor or at Hampton Court, which shows Nonsuch Palace in the distance, and it is sometimes said that the background of Van-Somer's picture of Henry VIII. and Edward VI. represents a portion of Nonsuch, but this I do not believe, because Nonsuch was left in a very unfinished condition by Henry VIII., in fact it was so far from being completed when Queen Mary came to the throne that it was condemned to be destroyed, but was saved by Lord Henry Arundel.

H. W. BREWER.

##### WEST HARTLEPOOL TECHNICAL SCHOOL, &c.

SIR,—Can you kindly inform me whether there is really such a place as West Hartlepool, and if so, whether they have railway and postal facilities and other indications of civilisation; and how far it is from Charing Cross? I sent in a design for a technical school and public hall to the address of some official of a supposed Corporation of the above supposed town, in reply to an advertisement from such persons.

It is more than nine weeks since such was sent, and I have not yet received the premium or any intimation as to when it will be sent, though I am sure that any competent person could in five minutes say that my design is everything that can be desired.

But even supposing that they are so misguided as to think some other designs should have the premium, it is high time that some intimation was given—supposing that the whole thing is not a myth.

"DUBIOUS."

##### WHITEHAVEN UNION INFIRMARY COMPETITION.

SIR,—In last week's number of the *Builder* was inserted the notice for the above competition.

The Guardians require eleven wards, with eighty-one beds, kitchen, bath-rooms, and the usual hospital adjuncts. Also a lump-sum estimate; the designs, which the "Guardians" consider best, are to receive the generous premium of twenty guineas, but it must be clearly understood that the Board

do not bind themselves to engage the architect whose design is accepted, to carry out the works."

Does this mean that if the plans of some local man are chosen, he will be given the work to carry out, whereas one, who is not known locally, would not be so favoured?

Then follows: "The designs, which will not, returned, must be sent to the undersigned," &c., &c. Can this really mean that the Guardians intend to keep all the other sets of designs, for which they have not paid anything, and would certainly make use of? And would they even be legally entitled to do so? If so, I, with many others, would be "Non-Competitor."

#### The Student's Column.

##### THE STRUCTURE AND PHYSICAL PROPERTIES OF BUILDING STONES.—VI.

EFFECTS OF VARYING TEMPERATURES.

THE student hardly requires to be reminded that bodies expand on being heated, and contract on being cooled, above their normal temperature, and that on being cooled below it they contract. Solid bodies, such as building stones, the expansion may be according to three dimensions—linear, superficial, and cubical. The co-efficient of linear expansion is the elongation of the unit length of a body when its temperature rises from zero to one degree; the co-efficient of superficial expansion is the increase of the surface being heated from zero to one degree; and the co-efficient of cubical expansion is the increase of the unit of volume under the same circumstances. It has been shown that these co-efficients vary with different bodies, but for the same body the co-efficient of cubical expansion is three times that of linear; whilst the co-efficient of superficial expansion is double that of linear.

Now, although it is a comparatively easy matter to ascertain these co-efficients for iron, steel, and the like, it is extremely difficult to do so for stones. The quantities to be measured are exceedingly minute, whilst the specimens usually operated upon are small. In this country, but very little attention has hitherto been bestowed on the subject—principally, we suspect, from the circumstance that the results of such an inquiry have not been thought to have such a practical bearing as in some other parts of the world. We hope to show, however, that defects in British building stone, often referred to other causes, have their origin in variations of temperature. In the United States the question has been carefully dealt with. The difficulty of obtaining permanently tight joints, even with the strongest cements, led Colonel Totten to institute a series of experiments with a view to ascertain the actual expansion and contraction of granite, sandstone, and marble when subjected to ordinary temperatures. Upwards of thirty experiments of each of these varieties of stone showed the rate of expansion and contraction, which seemed to be uniform throughout the range of temperatures employed, to be for granite '000004825 in. per foot for each degree Fahrenheit; for marble '000005668 in.; and for sandstone '000009531 in. Adie found† the rate of expansion of Aberdeen grey granite to be '00000438 in. for Sicilian white marble '00000613 in.; Galway black marble '00000247 in.; and Penrhyn slate '00000576 in. Let us suppose a case with two coping-stones each 5 ft. in length be laid in midsummer at a temperature of 96° Fahr. (which frequently obtains in certain parts of the United States), in winter the temperature falls to zero—a change of 96° Fahr. If the stones contract towards their centres, the whole length of stone put in motion will be five feet. In the case of granite, then (according to Col. Totten's experiments) the shrinkage amounts to '02779 in., in marble 0.3264 in., and in sandstone '054914 in. This shrinkage, small as it seems from necessity gives rise to cracks at the joints which admit the passage of water; continuous shrinkage and expansion must in time crumble the cement and leave the joint permanently open.

The effects of slow expansion as described would not produce such defects were all the stone employed in the construction to possess practically the same co-efficient of expansion; and it follows therefore, that a building of composite material

\* As far as that provision goes, it is a common form clause, to prevent the architect having a claim to carry out if he should happen to be a man against whom chance should turn, and an action on the part of the client.

† Totten "Stillman's Amer. Jour.," vol. xxii., p. 156; also Merrill, "Stones for Building and Decoration," New York (1891), p. 354.  
‡ "Trans. Roy. Soc. Edinburgh," vol. xiii., p. 366.



must suffer most in this respect. In any case, however, it is the joints that are most affected.

There is another aspect of this subject that has also received much attention in the United States, and that is the effect of the rapid accession of heat. From the architect's point of view this question resolves itself into two heads—(1) the effect on building stones during a conflagration; and (2) their disintegration and disfigurement owing to wide diurnal changes in temperature.

We have very little to say under the last heading, which has previously received some notice in our columns. But we may remind the student that the rapid change from mid-day heat to evening cold in tropical and semi-tropical countries has the effect of detaching quite large pieces of masonry, especially projecting masonry, from buildings, and that the phenomenon is often accompanied by a loud report. In Western America the thermometer often gives a range of more than 80 deg. Fahr. in twenty-four hours. In the Sahara and other African regions, as well as in Central Asia, the daily range is even greater. This rapid nocturnal contraction produces a strain so great as to disintegrate hard rocks into sand, or cause them to crack or peel off in skins or irregular pieces.

A very suggestive note on the "Effects of Alternations of Temperature on Terra-cotta Copings set in Cement" was communicated to the "Geological Magazine" some years ago by Mr. T. Mellard Reade, and though the general trend of his observations had special reference to the theory of mountain elevation, the facts adduced are of some interest in the present inquiry. He showed that a terra-cotta coping was permanently lengthened by the cumulative effect of alternations of temperature. The coping in question was freely exposed to the direct rays of the sun, and consisted of two courses of red Cuxton terra-cotta bricks set in cement upon a fence wall, built with common bricks in mortar, brick and a half thick. The courses were level, but, in consequence of the inclination of the road, the coping stepped down at intervals, so that the under course of bricks of one length was just gripped and held in position by the top course of the next length of coping. When he examined the coping, the end portion of one length abutting against the next length at the drop in the level was thrown up to a ridge of about 6-feet span, the coping bricks being lifted in the highest part 1 in. from their bed. There was a fracture at the crown of the ridge, and another at the springing, but for a distance of 30 ft. the coping was practically one solid continuous bar. A careful examination showed that the coping had "grown" about  $\frac{1}{4}$  in. longer than when it was first set, and that this lengthening, as evinced by movement on the corbel bricks which occur at intervals, was evenly distributed along a length of 30 ft. Mr. Reade states that he has observed several other cases in which the end brickwork and piers have been badly fractured by the force of expansion. When one end is partially free to move (not abutting against a solid pier or other obstruction) each expansion, however small, pushes the coping along towards the partially free end, and on contraction in cooling, the coping cannot draw itself back to the same position as before, so must either fracture or lengthen by increments. He remarks that the phenomenon is well exemplified in brick copings in the neighbourhood of Blundellsands, near Liverpool.

The effect of a conflagration on stone depends on the intensity of the heat, rapid variations in it, and the particular class of stone concerned. We have previously stated that if all the stone used in a building had practically the same co-efficient of expansion that less harm would result than if composite materials were employed. To carry this principle a little farther, we will lay down the law that if all the minerals in a building were expanded and contracted at the same rate during rapid heating and cooling that one stone would be as good as another (other things being equal) from the point of view of its selection to withstand fire. We know, however, that they do not. Minerals crystallize in several different systems, and, with few exceptions, exhibit, when heated, an unequal expansion in the direction of their different axes, in consequence of which the magnitude of their angles, and therefore their form, is altered. The co-efficient of cubical expansion for several of the more common rock-forming minerals has been determined as follows:—

Quartz .....	000036	Tourmaline .....	000022
Orthoclase .....	000017	Garnet .....	000025
Adularia .....	000019	Calcite .....	000002
Hornblende .....	000024	Dolomite .....	000035

The quartz, it will be observed, has a co-efficient of expansion double that of the orthoclase, and nearly a third greater than hornblende. The matter is further complicated by the fact that each individual mineral expands unequally, as before stated, along the direction of its various axes. If, therefore, we consider a granitic or syenitic rock in which these minerals play a conspicuous part, we should naturally suspect that on being rent asunder by heat, the damage must be attributed to the peculiar behaviour of its different minerals, which fight and struggle against each other in the stone as the heat varies in intensity. It has been remarked that the sudden cooling of the surface of a heated stone, caused by the repeated application of water from firemen's hoses, considerably assists in the general destruction of the material.

Before considering the divers characteristics of good fireproof stones, we may draw the reader's attention to some experiments directly bearing on this subject, which, if they are lacking in scientific accuracy, are at any rate approximately correct, and have the advantage of being readily understood and easy to carry out. Instead of ascertaining the co-efficient of expansion of the materials, a muffle furnace was employed in the determinations.

In those carried out with reference to the building stones of Minnesota\* the temperature of the muffle was raised to a red heat; then the samples of stone, one after another, were exposed to the heat of the muffle, being at first placed near its open mouth, then gradually moved inward until they came into the hottest part, and were heated to redness. Observations were made on the effect of the heating. They were lifted out with tongs once or twice and closely inspected. After the heating test the pieces were severally removed, and whilst still very hot, but at a temperature below redness, they were immersed in a tank of water for a few minutes. The action of the water in crumbling or cracking the heated stones was then noted. In these experiments, as well as in those about to be described, correctness depends much, of course, on the judgment of the operator, which is an uncertain quantity.

Another method, dealing with the building-stones of New York State,† is as follows:—Small cubes of stone were closely packed in the closed muffle of a Hoskins' assay furnace. A copper rod was inserted in the opening at the top of the muffle, and its lower extremity brought to the centre of the mass of cubes, an opening having been left for the purpose. This lower end could be seen from above without removing the rod. Heat was then applied and the blast gradually increased until an intense heat was produced. The copper rod was closely observed and as soon as its extremity began to show signs of melting the heat was guarded; at the first fusion it was altogether turned off. The muffle was then opened and the samples removed and laid upon a clay support in the open air. They cooled rapidly and their condition was noted. The strength of the cold samples was roughly tested by light blows with a hammer.

There is no necessity for us to follow out in detail the results of these experiments; it is sufficient to note that they demonstrate the superiority of sandstones as a class over granites, marbles, and limestones: whilst the last mentioned are prone to calcine at high temperatures. At the same time those tests referring to New York stone clearly prove that there is considerable variation in the fireproof qualities of sandstone. In some of the latter the strength was impaired but little by the heating operation, whilst in others the stone was greatly weakened and scaly; the strength had nearly disappeared in some which crumbled under one blow of the hammer; one specimen crumbled to the finger touch; and two others were practically left as heaps of sand.

Igneous rocks as a whole—granite, syenite, basalt, and the like—are undoubtedly the worst to withstand heat. The relative durability of freestone and granite under fire was well shown, in the burning of St. Peter's Church, Lamerton, near Tavistock, not many years ago—to take an example. The church itself which was built in great part of granite, was completely ruined, whilst the tower, made of a local freestone, around which the heat of the fire was so great as to melt

six of the bells as they hung in the belfry, was left intact, although the granite window-jamb and sills were destroyed.

As fire-proof ashlar we should prefer the finer-grained compact varieties of sandstone to any other kind; whilst compact limestones and dolomites are better than granite or syenite. For "strong-room" purposes slate has been extensively used for shelves, &c.; and for the backings of furnaces the stone raised from the Upper Greensand of Godstone and vicinity has been much in request. Fire-proof bricks have been much largely employed, but the consideration of these is not at present within our scope.

We have considered the effect of great heat on stone; let us now glance at the action of extreme cold. This was partially referred to in our observations on the absorption experiments, so that the matter may now only be discussed apart from porosity. As heat causes considerable expansion, so does intense cold lead to contraction; but it will be evident that the range below the normal temperature of building stones is not so wide as above it, and the effects of contraction *per se* are consequently not so manifest. Moreover, on the temperature falling below zero, the rate of contraction of stone in bulk must be considerably retarded by the expansive force exerted during the formation of ice within the pores of the material, where the latter contain sufficient water to permit the crystallisation of that fluid.

It has never yet been shown, so far as we are aware, to what depth ice can form in building stone; theoretically we should imagine that the refrigeration could only take place in the outer exposed skin of the material, and that the actual depth must be controlled by porosity, and relative heat and pressure internally. Be that as it may, we can assume that it is only the outermost inch, or less, that is practically affected during frosts.

The expansion and contraction during sudden changes of temperature must be largely superficial, and points of weakness are no doubt created in stone from this cause just underneath their exposed surfaces, by the rapid movement of the outer skin over the more rigid core of the material.

#### OBITUARY.

MR. J. STOTT.—The death is reported of Mr. Joseph Stott, an Oldham architect, who died at his residence, Ellerslie, Queen's-road, on the 21st ult. He was the architect engaged in the erection of a large per-centage of the local cotton-mills. He was fifty-seven years of age.

#### GENERAL BUILDING NEWS.

NEW CHURCH, COGAN, GLAMORGANSHIRE.—On the 29th ult. the Lord Bishop of Llandaff opened the new church dedicated to the Holy Nativity at Cogan. The church is in the Perpendicular style, and is capable of holding about 311 people. It consists of nave, choir, sanctuary, transept, organ space, and vestries, with porch, west bell-cote (two bells), and heating-chamber with Musgrave's apparatus (hot air). The nave is 59 ft. long by 25 ft. in width, and will be seated with chairs. The transept is 15 ft. by 15 ft., and the sanctuary, 15 ft. by 14 ft. The total height to the ridge is 39 ft. The walls are built of local limestone in thin courses, lined internally with red and buff Cattybrook bricks, relieved with Bath stone bands. The nave is floored with wood blocks throughout, and the choir and sanctuary with tiles. The church will be lighted by gas from wrought-iron cornucopias and brackets. The font is a facsimile of the Norman font, which is now broken and much mutilated, in the ancient small church of Cogan. The work has been carried out by Mr. Wm. Richards, of Barry, from the design and under the supervision of Mr. C. B. Fowler, of Messrs. Kempson & Fowler, of Cardiff. The pulpit is of alabaster, red Dumfries and green Bridgend stones, the panels being filled with green Irish marble.

NEW TECHNICAL SCHOOL, AT LYNN.—On the 2nd inst. the Duke of York opened a new technical school at Lynn, which has been erected there at a cost of about 2,300*l*. The new school consists of a square block of 50 ft. with a small projection of about 18 ft. by 14 ft. It is a plain brick building, the face and moulded bricks being manufactured at Messrs. Bardell's Bawsey brick-works. The window heads and sills and the gable copings are of York-shire stone. The roofs are slated and finished with Staffordshire red ridging. On entering the building is an entrance-hall 8 ft. wide. The first room on the right is the workshop, 22 ft. by 16 ft. On the left of the entrance-hall is the kitchen, to be used as the laboratory for instruction in cooking, and on the right is a door leading into the lecture-theatre, which is 33 ft. by 22 ft., and has seating accommodation for over 100 students, the seats being raised in tiers. Facing the main entrance of the building is a door leading into the physical laboratory (24 ft. 6 in. by 24 ft. 9 in.). On the first landing are

\* "Geol. Mag." (1893), p. 26.  
† Clarke's "Constants of Nature" (Smithsonian Miscellaneous Collection, vol. xiv.).

\* N. H. Winchell, "The Geology of Minnesota" vol. i. (1884), page 185.  
† J. C. Smock, "Bull. New York State Museum," vol. ii. (1890), p. 358.



the ladies' cloakroom and lavatories, which are immediately above those for the men. On reaching the first floor, immediately opposite is the door leading into the class-room and the art room, which may be thrown into one large room extending the whole length of the building, 49 ft. 9 in. by 22 ft. Here accommodation is provided for eighty students. The room has a revolving screen in the centre, by means of which it can be divided into two separate rooms. The northern part of the room is used mainly for art work. Over the physical laboratory is the chemical laboratory, which is fitted with benches for twenty-seven students. Over the kitchen is the master's room, and above the entrance-hall is a balance-room. The master's room and kitchen have open fire-places, but the rest of the building is heated throughout with hot water. The ventilation is effected by means of flues specially arranged in the walls, and all leading up to two large Boyles' extractors placed upon the roof. The lighting is carried out by means of gas sunlights. The whole of the internal fittings are pitch-pine varnished, with teak tops to the tables. The lavatories are lined with white glazed bricks, and the entrance-hall has a tiled floor, all the rest of the flooring being of wood. The whole of the architectural work has been carried out by Mr. E. J. Silcock, C.E., the Borough Surveyor; Messrs. Jarvis & Melton were the contractors, and Mr. D. Clark clerk of the works.

**TURKISH BATHS, SOUTHAMPTON.**—New Turkish baths, situated on the Western shore, Southampton, have just been completed. The baths have been erected at the south-east end of the already existing baths, the work being carried out by Messrs. Crook & Son, from designs and plans by the Borough Surveyor (Mr. W. B. G. Silcock), at a cost of some £1,000. The buildings consist of a dressing-room, three hot rooms, shampooing-room, lavatorium and plunge-bath, and cooling room. The furnace is specially constructed with steel radiators, through which the cold, pure air passes, and is discharged into the hottest room and onwards. The impure air is drawn out of each room by means of a conduit, which is regulated outlets, this conduit being attached to an upset shaft by the side of the smoke-flue. Each of the hot rooms is lined with white glazed bricks. Entrance to the Turkish bath is obtained through the general baths.

**BAPTIST CHAPEL, DONCASTER.**—A Baptist school chapel was opened at Doncaster recently. The architect was Mr. Herbert Athorn, and the builder was Mr. B. Wortley, of Nether Hall-road. The new building is in the Domestic Gothic style. The large room is 55 ft. by 34 ft. There is a minister's vestry at the rear, and class-rooms. There is a platform at the end of the large room, with a reading or preaching desk, and underneath the platform is a store-room. Immediately in front of the platform is the baptistry.

**BATHS, COVENTRY.**—The new baths, in the Pool Meadow, on the east side of Priory-street, Coventry, were opened recently by the Mayor. The building—erected from the designs of Mr. Harold T. Burgess, a pupil of Messrs. Spalding & Cross, and whose plans were awarded the first premium of £200—has a frontage of 132 ft., and extends back to a depth of 236 ft. The front is of pressed bricks relieved by stone dressings in foliated designs. In the centre it is three stories high, flanked on each side by a one-story wing. This part contains on the ground floor the ticket-office and waiting-rooms—which are entered from vestibules—and above these the caretaker's quarters. There are separate entrances for ladies and gentlemen, with the ticket-office between. The swimming accommodation consists of three large baths, 35 ft. by 90 ft.—first and second class for gentlemen, and one exclusively for ladies. For gentlemen there are ten first-class and twenty second-class slipper-baths, and for ladies four first-class and six second-class slipper-baths, each private bath, as also the swimming-baths, having a shower apparatus. In the first-class men's bath are fifty-eight dressing-boxes. Above the dressing-boxes a gallery is carried all round the bath for spectators. The gallery is reached by the main staircase from the front hall, and is also provided with two additional staircases from the corridor, which extends the whole length of the building, and leads to the men's second-class baths. The roof over the first-class bath is supported by upright columns and wooden beams elliptical in shape, and has a continuous skylight nearly the whole length, and the ventilation is worked from the gangways. The bath is lined with white glazed bricks, with blue ones introduced in various patterns at intervals. The other two swimming-baths—the ladies' and the second-class men's—are similar in size, construction, and appointments, except that there is no gallery. In the boiler-house are two Cornish boilers, each 24 ft. by 6 ft. From this place entrance is gained to the subways, which pass all round the building. The boilers are by H. & T. Danks, of Netherton. The engineers' work was entrusted to the Coventry Gas Fittings Co., after competition. The clerk of the works was Mr. A. Davies.

**PROPOSED ALTERATIONS TO PRESBYTERIAN CHURCH, CARLISLE.**—It is proposed to alter and enlarge Fisher-street Presbyterian Church, Carlisle, from plans prepared by Mr. T. Taylor Scott, architect, of Carlisle.

## SANITARY AND ENGINEERING NEWS.

**UXBRIDGE SEWAGE SCHEME.**—On the 26th ult., Major-General C. Philips Carey, R.E., held a Local Government Board inquiry at the Town Hall, Uxbridge, with reference to a loan for works of sewage disposal. Mr. Garner, Solicitor to the Board, explained the reasons for the application for the loan, stating that it included the construction of precipitation tanks for the Ferozone treatment, six Polartite filter beds, together with sludge pressing machinery, air-compressing plant, and engine with pumps for raising the sewage. It is intended to proceed with the work almost immediately.

**SANITARY INSPECTORS.**—At a general meeting of the Institute of Certificated Sanitary Inspectors, held at the Parkes Museum, 74A, Margaret-street, W., on the 31st ult., the President, Professor A. Wynter Blyth, M.R.C.S., L.S.A., in the chair, it was unanimously resolved, on the motion of Mr. W. J. Pearce Jenkins, of Bodmin, Cornwall, seconded by Mr. William Parsons, of Richmond, that a representation on the following matters be made to the Right Honourable H. H. Fowler, M.P., President of the Local Government Board, with a view to their consideration in connexion with the Local Government (England and Wales) Bill:—1st, "That the term 'Inspector of Nuisances' be abolished throughout the provinces, and that Sanitary Inspector be substituted therefor as in the Metropolis under the Public Health (London) Act, 1891." 2nd, "That in the interest of public health, and for the proper performance of public duties, it is advisable that permanency of office and some provision for the superannuation of Sanitary Inspectors be made." 3rd, "That a clearer definition of the position and duties of Sanitary Inspectors than that contained in the General Orders of the Local Government Board is necessary."

## FOREIGN AND COLONIAL.

**FRANCE.**—Parliament has authorised the municipality of Paris to apply a sum of seventy million francs for the completion of certain large road-making operations. An exhibition of the landscapes of M. G. Billet has been opened in the George Petit Gallery. An exhibition of "neopressionist" painters has also been organised at No. 20, Rue Laftite, and an exhibition of "Pastellistes Français" will be held next month in the George Petit Gallery. —M. E. Harancourt, the poet, has been appointed curator of the Museum of Comparative Sculpture at the Trocadéro, in place of the late M. Paul Delair. —M. Gaston Redon, architect, has completed the tomb of France the composer, the sculptural portion of which was executed by M. Rodin. —The Minister of Public Instruction has granted to the town of Saint-Brieux the necessary vote for the reconstruction of the ancient church of Cesson, which is classed as a "monument historique." —Last Sunday was opened the new railway from Douanenez to Audierne, which gives tourists access to one of the wildest and most picturesque parts of Brittany, the peninsula of Penmarc'h. —The "Société Nationale des Architectes de France" is organising a competition, in which all French architects or architectural students between the ages of eighteen and twenty-five can take part, for a design for "a villa in the environs of Paris intended for permanent habitation." Designs are to be sent in by May 26.

—There is talk of raising, by subscription, a monument in commemoration of the Franco-Russian alliance, both at Paris and St. Petersburg. The monument is to be designed by M. Charpentier. —M. Mathurin-Moreau has just finished the model for the monument which is to be erected at Dijon to the memory of Pierre Joigneux, the agricultural specialist. The monument will include an allegorical figure offering a palm to the bust of Joigneux placed on a column. At the foot a figure inscribes on a tablet the names of his principal works. —The widow of J. F. Millet, the painter of the "Angelus," has just died, at the age of sixty-six. —The death is announced, at the age of eighty-two, of M. Debressenne, honorary architect of "Bâtiments Civils et Palais Nationaux," and Chevalier of the Legion of Honour. —We have also to mention the death of M. Armand Cugnard, an able architect and member of Société Centrale des Architectes, at the age of sixty-nine. —The painter Armand Gautier has died at the municipal "Maison de Santé," at the age of sixty-eight. He was born at Lille in 1825, and had received medals in the Salons of 1853, 1861, and 1882. His picture, "Les Folles de la Salpêtrière," had a great success in the Salon of 1857, but he was the object of systematic exclusion on the part of juries, one of his very best works having been refused one year. —The department of Fine Art and Travaux Historiques in the Paris Municipality has established a table or list of streets and houses in Paris which present artistic interest. On the basis of this, when a house is to be destroyed in the formation of a street, or from any other cause, the inspector for the district will inform the department, which will take the necessary steps to protect whatever portion of the property is of any historic or artistic value. —According to the latest information in regard to the work of the General Committee for the 1894 exhibition, all the buildings of the last

exhibition will be removed except the Eiffel Tower and the "galerie des machines." The Trocadéro will be divided into pavilions for separate departments of the exhibition; the Fine Arts will be installed in the Palais de l'Industrie, enlarged, rebuilt, and connected with it will be two parallel new galleries; and a large bridge thrown across the Seine, opposite the Esplanade des Invalides, will connect the left bank of the river with the Cour la Reine. —The Hôtel de Ville of Libourne and Nevers are to be rebuilt shortly. —We regret to have to record that the aged sculptor Cavalier, of whose dangerous state of health we spoke last week, has died since our last notes were written.

## MISCELLANEOUS.

**HYDRAULIC POWER, MANCHESTER.**—We are informed that on the 26th ult. the scheme for the supply of hydraulic power by the Manchester Corporation was successfully put into operation, and the first supply of water was given to a set of hydraulic lifts erected by Messrs. Archibald Smith & Stevens, in the new Mosley Hotel and adjoining premises. The new power will be regularly available from the 1st day.

**EASTON, ANDERSON & GOULDEN, LIMITED.**—The company under this name, recently registered, is an amalgamation of Easton & Anderson, the old established engineering firm, of London and Eriton, with Messrs. W. T. Goulden & Co., electrical engineers, Woodfield Works, Harrow-road, London.

**AN OLD HOUSE IN CLOTH-FAIR.**—At present there is being demolished at the east end of Cloth-fair a quaint ancient gabled house, which is reputed to have been built four centuries ago. There is a local tradition that the edifice was a generation of two ago, a notorious thieves' establishment. Although by the gnawing of countless generations of rats, together with the action of damp, the heavy woodwork of the basement of the house is very much decayed and decayed, the upper oak, teak, and walnut internal fittings are generally as sound as when first placed in position. We understand that it is intended to erect a factory on the site, but the plans are not yet passed, as, with the object of ultimately widening Cloth-fair when the leases fall in and the houses are demolished, to which merchants from Flanders and Italy used to bring their wares, was "a place generally inhabited by drapers and mercers, and is of some note." A few years ago a local antiquary thus eloquently wrote of Cloth-fair:—"There are narrow tortuous streets, and still narrower courts, about Cloth-fair, where are hidden away scores of old houses, whose projecting eaves and overhanging floors, heavy cumbersome beams, and wattle and plaster walls must have seen the days of the Plantagenets and the earlier Tudors. To the real lover of the past, history of our great City, to the pious student of the early times of our English Church, and her struggles after freedom, there is no part of modern London that will better reward a careful survey."—*City Press.*

**STUDENTS' PRELIMINARY EXAMINATION, SURVYORS' INSTITUTION.** Of the candidates who presented themselves at the preliminary examination of the Surveyors' Institution, held on the 24th and 25th ultimo, sixty-seven satisfied the examiners.

**CITY AND GUILDS OF LONDON INSTITUTE.**—The Executive Committee of this Institute has changed the name of the Guilds Central Institution in Exhibition-road to the "Guilds Central Technical College," by which title it will henceforth be known.

**A NEW LETTER-CARD.**—Messrs. Beecching & Son send us their "Save-time Letter Card," which is perforated so as to be opened with two tearings, instead of the four required for the usual form of letter-card. It seems really an improvement.

**A FIRE-ESCAPE.**—Mr. J. W. Palmer sends us an illustration and description of his "portable chain fire-escape," which is a light chain ladder to be fixed to staple in the wall inside an upper window, and kept rolled up in a box with the lid made to close over it when not in use, the box being capable of being utilised as a table. When required, the lid of the box is lifted and the ladder lifted over the window-sill and allowed to unroll. Two loose ropes at the foot allow of it being held, and to staple away the wall inside an upper window, to make it easier of descent. We do not know whether it can quite be said that the "most timid could descend it with safety"; at all events, the "most timid" would dislike the job very much, and women would find the weight of such a rolled-up chain-ladder a very considerable matter to lift out of the box and over the wall. However, it has the merit of being cheap, simple, and with nothing to get out of order, and, as the inventor says, it could be used from back windows where the official fire escape could not be got.



**SILENT MICA FLAP.**—Messrs. Comyn Ching Co. claim to have got rid of the annoying rattling which occurs from the mica flap ventilators, and which often arises from sudden back-draughts, by proposing instead the mica flap a fixed metal baffle pierced with holes which are conical in shape, projecting in the direction of the draught. There is a third while the indraught is helped and moderated by this strainer with conical apertures, the size of the apertures, presenting the small end to the back-draught, tends to check it. The device is in attention.

**LONDON STREETS AND BUILDING BILL.**—Mr. H. Jones and Mr. Geo. Wallace, the solicitor and surveyor respectively to the St. Giles' District Board of Works, have prepared what is called "A Handy tract of the Clauses of the Bill," including also index to the principal provisions, and a table comparing the Bill with the existing law. The former item is the most useful portion of the work, and shows at a glance where to look for new legislation. In other respects we do not know that there is any more difficulty in going through the Bill than through the abstract, but it may save a little time in showing more easily where to look for the treatment of special subjects in the Bill.—meeting of the North-East London Property Owners' Association was recently held to consider Bill, when the following resolution was passed: That this Association looks with dismay at the proposed Bill 'to Consolidate and Amend the enactments relating to Streets and Buildings in London,' introduced by the London County Council, and considers some of its provisions unreasonable and fiscally.

**TRAINING CLASSES FOR HOUSE PAINTERS.**—Two weeks ago we noticed some efforts which were being made to provide for the painters of London the practical instruction, as a substitute for the apprenticeship system. Since then the Painters' Company has been enabled, by the royal action of the Carpenters' Company, to organise a class of this nature in the building in at Titchfield-street, which the last-named company has taken and fitted expressly as a training school for the building trades. The class for painters will open on Tuesday, the 13th inst., and will be held each Tuesday and Friday evening from 7 to 9 p.m. At the same time a course of practical lessons to painters is being given in the old Hall of the Company. The two which have already been given were fully attended.

**CARPENTERS' COMPANY.**—This company has arranged, as usual every year, for a course of six lectures to be given at their Hall in London on matters more or less directly connected with building work. The first lecture will be given on February 21, by Professor Unwin, on "The Utilisation of Niagara." Other lectures are to be given on five successive Wednesdays by Professor Field, Mr. T. E. Collcutt, Professor Banister Fielder, Professor Silvanus Thompson, and Professor Roger Smith.

## LEGAL.

### IMPORTANT PARTY-WALL SUIT:

**ACTION BY THE MAYFAIR PROPERTY CO.**—On Wednesday last week in the Chancery Division, Mr. Justice North delivered judgment in case of the Mayfair Property Company, Limited, v. Johnston, which he had had before him two days. It was an action for partition in respect to the party-wall dividing No. 35 & No. 37, Hyde Park Gate, and there was a motion to commit to prison the plaintiff's architect, Mr. W. Swinfield, Mr. Swinfield, Q.C., along with Mr. Peterson, represented plaintiffs; and Mr. Cozens-Hardy, Q.C., and Curtis Price were counsel for the defendants. It may be mentioned that the present suit was the outcome of proceedings that were discussed in the Court several times during the course of last year, and arose from the plaintiff's desire to put up a new building in place of the old one (No. 37) and in doing so the wall dividing the two properties suffered, hence the relations between the parties became complicated, and this a prior action was the result. After a prolonged argument by counsel, and a mass of evidence being given on both sides, the learned judge gave judgment, and said the defendants' building was to be separated from the wall, and he decided about a year ago that that wall—if not legally conveyed to either party, the separate owners of the two houses belonged to the owners of the houses respectively tenants in common. That was to say, each of them was entitled to the whole of it, each was entitled to a moiety of it, but it was an undivided moiety. The plaintiffs proposed to erect new buildings and in doing so interfered with the old wall. They said that they took the view of the garden wall belonged entirely to them, and they wanted to pull it down for the purpose of substituting stronger and more substantial; and they accordingly proceeded to pull it down, commencing on March 13, 1893. They completed the new buildings in July last. He thought the present defendants were entitled to partition as provided

by the old statutes of Henry VIII., and as to the mode in which it should be carried out he did not think it necessary that they should go through the usual form of inquiry in Chambers. It was desired that the partition should remain by giving to the owners of the land the western half of the wall, divided longitudinally, and the owners of the wall that half east of the wall; and, therefore, the partition should be carried out in that way with the proper conveyances for the purpose. So much as to the action for partition. The counter-claim by the defendants asked for an injunction to restrain the plaintiffs from completing the foundations and footings which encroached upon the defendants' land. Something had been said about an easement, but his Lordship said there was nothing of the kind subsisting. Each of the parties would now have the same control over his own land as if he had no neighbour at all. It was not disputed that there had been a trespass committed by the plaintiffs, and it was trespass underground. The materials placed upon the defendants' land by the plaintiffs became the defendants' property, and the plaintiffs would not be entitled to remove them. He was asked to make a mandatory order for removing them, but he saw no reason for doing it. The remedy was in the hands of the defendants. The encroachment was deliberate and wilful, and he gave the defendants, by way of damages, £15, which would bear the cost of removal. His Lordship further said it was a case in which the plaintiffs' property might have been sequestered, or he might have ordered the pulling down of the building. Instead of that he gave them an order for taking proceedings for partition, and they had done this in order to avoid the penalties of having committed a breach of the injunction made against them. In his opinion, therefore, they ought to pay the costs of the action, including the costs of the counter-claim; and as regarded the costs of the motion, the respondents to the motion being in the wrong, would have to pay the costs of it.

Judgment accordingly.

### ALLEGED OBSTRUCTION OF THE "OXFORDS" LIGHTS.

On Wednesday, in the Court of Appeal, the "Oxford," Limited, v. Kirk was a case which came on for hearing before Lord Justice Lindley, Lord Justice Smith, and Lord Justice Kay, on appeal of the plaintiff company, the proprietors of the well-known music hall, from the order of Mr. Justice Kekewich, dated January 26, dismissing a motion to restrain the alleged obstruction of ancient lights. Mr. Marten, Q.C., and Mr. Eustace Smith, appeared for the appellant company and Mr. Rawlins represented the respondent.

Mr. Marten said the injunction refused by Mr. Justice Kekewich was sought to restrain the defendant from erecting, or permitting to remain erected, any hoarding or obstruction calculated to obstruct the ancient lights and windows on the west side of the plaintiff company's building. There was no question at all about the lights being ancient, or as to the obstruction; and the defence of the defendant, who was the adjoining owner, really rested on a document entered into by the lessee of the Oxford—the plaintiffs now being the persons who were the owners in fee. The Counsel proceeded to define the documents connected with the early history of the property, when

Lord Justice Lindley asked whether they were going to take this as the trial of the action.

Finally, on counsel for the respondent undertaking to withdraw the temporary obstruction, it was agreed to send the case back to Mr. Justice Kekewich for trial.

## RECENT PATENTS:

### ABSTRACTS OF SPECIFICATIONS.

2,320.—VENTILATORS: *A. C. Harris and others.*—According to this invention, a shaft or tube, with its outer end expanded as a bell mouth, is fixed, with a cap, also of bell shape, fitted so as to prevent downward, and create upward, draught. This arrangement also allows the chimney to be swept without inconvenience.

2,323.—VENTILATING COWLS: *W. Davis.*—To prevent down draught, a top or cowl, by means of this invention, fits directly over the top of the chimney or shaft. This "tailboy" is fixed with a cylindrical chamber of a size so much larger than a considerable annular space is formed between the "tailboy" and the chimney. Within the chamber are a number of flap lids of mica, which rise when there is an upward draught, but close when downward pressure of air is upon them.

2,326.—FIREPLACES: *P. Hellmich.*—This invention provides for a steam jet from a boiler affixed near the stove which, discharging into the burning fuel, aids the combustion, and obviates smoke.

2,342.—IRON PAINTS: *M. N. D'Andria.*—This patent relates to the manufacture of red iron paints from protosulphate of iron by dry distillation, utilising at the same time the sulphuric and sulphurous acid evolved in the process.

2,497.—SLATE OR TILE ROOF RIDGING: *M. A'lova.*—Instead of rigging made in two or three pieces and secured to the roof by nails, screws, clamps, or cement, the improved rigging, which forms the subject of the patent, is formed in two interlocking parts, and fixed without such aid. The continuity of the sky-line is broken, giving to the rigging a more ornamental appearance.

2,673.—WHITE LEAD: *J. V. Walton.*—This patent relates to improvements in the manufacture of white lead by the Dutch method, so that the grinding and packing of

the white lead without injurious effects to the health of the operatives is accomplished.

22,586.—WINDOW FASTENERS: *A. J. Feurers.*—According to this invention, a quick-threaded screw turns in a bush fixed in the meeting-rail, and a corresponding screw and thread enters the second meeting-rail, drawing the sashes together and completing the fastening.

22,787.—WATER-CROSER BASINS: *H. P. Allen.*—The basin is furnished with a curved arm, the inlet of which is considerably higher than its outlet. By arranging such a drop the passage a precipitous rush of water is acquired, and this is made to drop directly upon the top of the soil, which is removed through the trap connected with the neck of the basin. Instead of "revolvers" for surface flushing, the water is made, by the same apparatus, to run directly into the basin, and give an effective flush.

### NEW APPLICATIONS FOR LETTERS PATENT.

JANUARY 22.—1,334, W. Brown, Safety Wedge Cap for Securing Tools to Handles, &c.—1,352, T. Strover, Louvre Chimney Top.—1,369, J. Aldridge, Tile for Roofing and Facing Buildings, &c.—1,366, J. Rumgay, Hanging Doors and Gates.—1,370, A. Hooydonk and H. Hooydonk, Preparation or Compound for Decorating the Interior of Buildings.—1,371, E. Bonford, Drain or Sanitary Pipes for Streets and Roads, and for Draining Purposes Generally, and in Joining the said Pipes.—1,377, C. Morel and A. Heimpel, Apparatus for Crushing Dry or Wet Materials, such as Cements, Lime, Plaster, Alabaster, &c.—1,390, J. Alty, Preventing the Freezing of Water in Pipes laid within Dwelling-houses or other Buildings.—1,391, H. Leigh, Paving Blocks.

JANUARY 23.—1,404, T. Holliday and J. Robson, Constructing Window-sashes for obtaining Ventilation or reduced Draughts.—1,422, S. Morley, Gulleys.—1,427, A. McArar, Portland Cement.—1,430, B. Reynard, Coping.—1,432, K. Sawyer, Sanitation.—1,494, F. Weiss, Fastenings for Door, &c.

JANUARY 24.—1,519, J. Edwards, Lead Lattice-work.—1,534, J. Clarkson, Wood-screws.—1,445, T. Rees, Lathing used in the Formation of Partitions, Ceilings, Cornices, &c.—1,547, N. Lovens, Transportable Glue Stove.—1,559, H. Lanchester, Fire-proof Floors, &c.—1,590, C. Martens, Cows.

JANUARY 25.—1,631, W. Osborn, Burglar-proof Window and Door Protector.—1,646, H. Burton, Automatic Safety Window-catch.—1,658, A. Soar, Tread for Stairs, &c.—1,679, H. Lake, Water-closets.

JANUARY 26.—1,696, J. Fleming and J. Summell, Wash-hand Basins.—1,754, P. Shippobottom, Sliding Windows, Skylights, Doors, &c.—1,727, J. Bull, Panic Bolt for Theatre-doors, &c.—1,733, J. Louvet, Closing, Fastening, and Holding Doors Open.—1,747, The Ariel Company, Limited and S. Allin, Door Check.

JANUARY 27.—1,799, M. MacGregor, Automatic Closing of Doors.—1,816, J. Hope, Fixing and Making Water-tight Sheets of Glass and other Materials employed in covering Roofs and other Structures.

### PROVISIONAL SPECIFICATIONS ACCEPTED.

22,507, J. Stables, Window Fasteners.—24,632, J. F. H. of Pipes.—25,356, W. J. Burtlett, Waste-preventing Cisterns and Syphons for Water-closets, &c.—23,608, T. Pennington, Weather Guard for the Bottom of Doors.—23,993, F. Bostel, Flushing Cisterns.—24,965, A. J. Closser, J. C. Liney, Drain Pipes.—83, J. Barber, Braces for Cabinetmakers, Carpenters, &c.—265, G. Oulton, Baths, Lavatory Basins, &c.—342, C. Hengst and C. Fox, Union, or Junction for Pipes and Tubes.—351, J. Blakeley, Syphon Cisterns.—355, T. Hill and G. Mackie, Fastenings or Catches for Windows and Doors.—600, J. Taylor, Prevention of Draughts in Dwelling-houses and other Buildings.—655, E. Edwards, Stones for Paving.—693, A. Rickard, Windows.—700, H. Smith, Decorating Walls and Ceilings, and making them Impervious to Damp and Dirt.—756, H. Lake, Stepladders.—773, J. Wheelodon, Rotary Wood-planes.

### COMPLETE SPECIFICATIONS ACCEPTED.

#### (Open to Opposition for Two Months.)

6,207, A. Cooper, Fastener for Sashes, Casements, &c.—23,818, E. Wiekke, Construction of Roofing Tile.

## SOME RECENT SALES OF PROPERTY:

### ESTATE EXCHANGE REPORT.

JANUARY 29.—By *R. A. Motley*: 1, 2, 3, Oakdale-rd., Leyton, E. 450s. 12, Stafford Tg., Kensington, u.t. 52 yrs., g.r. 20s. 1,300s.; 90, Stenmande-rd., u.t. 88 yrs., g.r. 7s. 10s., r. 40s. 1,300s.

JANUARY 30.—By *Wilton & Son*: No. 147, Newington Butts, E. r. 70s. 1,200s.; 11, Myatt-rd., E. 61 yrs., g.r. 4s. 10s., r. 25s. 21s.—By *J. Batt*: "Eden-hurst," Trinity-rd., Herne Hill, E. 7, 1,700s.—By *C. H. Brown*: 15, Frederick-st., Westminster, u.t. 3 yrs., g.r. 10s. 27s.—By *C. H. Davies*: 22 to 30, Cornelia-st., Barnsbury, u.t. 36 yrs., g.r. 37s. 1, 20s. 8s. 64s.; 36, Tollington-rd., Holloway, u.t. 55 yrs., g.r. 6s. 6s., r. 32s. 35s.—A plot of 1/2 land, Uxbridge-rd., Hanwell, 160.

JANUARY 31.—By *White, Carter & Co.*: 12, Beckenham-rd., 794s. Chester and Cornwall Tg., Regent's Pk., u.t. 20 to 26 yrs., g.r. 145s. with reversions; also, Cornwall Tg., u.t. 26 yrs., g.r. 21s. 1,200s. 14,500s.—By *Hunter & Hunter*: 1 g.r. of 35s. 12, De Beauvoir, Hackney, u.t. 25 yrs., no g.r., 37s.; 1 g.r. of 42s. Englefield-rd., u.t. 27 yrs., g.r. 30s. 3s., 150s.; 1 g.r. of 13s. Stamford-rd., u.t. 25 yrs., g.r. 8s. 50s.; 1 g.r. of 18s. 6s., Eagle Lane, Sharnbrook, u.t. 62 yrs., no g.r., with reversion for 11 yrs., 395s.; 1 g.r. of 13s. 10s. Birbeck-rd., Tottenham, reversion in 85 yrs., 325s.; 1 g.r. of 28s. Bruce Castle-rd., reversion in 84 yrs., 640s.—By *Rushworth & Stevens*: 1 g.r. of 24s. Milman-st., Chelsea, reversion in 74 yrs. 615s.; 1 g.r. of 48s. Gilray-sq., u.t. 79 yrs., g.r. 6s. 72s.; 1 g.r. of 64s. Ebury-st., u.t. 30 yrs., g.r. 5s. 5s., 895s.—By *White, Carter & Co.*: 51, Hampden-st., Harrow-rd., u.t. 51 yrs., g.r. 5s. 1, 20s. 265s.; 9, Eamant-st., St. John's Wood, u.t. 30 yrs., g.r. 5s. 1, 20s. 50s.; 25, Queen-st., Edgware-rd., u.t. 7 yrs., g.r. 4s. 1, 30s.—By *R. T. Tidy & Son*: 101 to 107 (odd), and 135, Blackstock-rd., Highbury, u.t. 72 yrs., g.r. 31s. 10s. 1, 158s. 1,200s.; 1, De Beauvoir-rd., Kingsland, u.t. 39 yrs., g.r. 7s. 10s., r. 50s. 300s.; 11 to 14, Buckland-st., u.t. 40 yrs., g.r. 28s. 1, 144s. 1,290s.; 10, Albion-rd., u.t. 45 yrs., g.r. 1, 42s. 28s.

FEBRUARY 1.—By *Newdon & Co.*: 4, Angleley-rd., Holloway, u.t. 56 yrs., g.r. 6s. 1, 32s. 265s.; 17, 19, 21, Tottenham-rd., u.t. 70 yrs., g.r. 18s. 1, 73s. 880s.; 45, 47, Cottenham-rd., u.t. 70 yrs., g.r. 12s. 1, 95s. 375s.; 23, De





ESTOKE (Hants).—For new proposed ward and other works on the Alverstone Union, Mr. Harry A. F. Smith, architect, 1, Dugan Street, London, W. 1. £1,500 0 0  
M. Rappley & Son, £1,400 0 0  
Sons, £1,200 0 0  
Sons, £1,100 0 0  
Sons, £1,000 0 0  
Sons, £900 0 0  
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Sons, £0 0 0 1/65536  
Sons, £0 0 0 1/131072  
Sons, £0 0 0 1/262144  
Sons, £0 0 0 1/524288  
Sons, £0 0 0 1/1048576  
Sons, £0 0 0 1/2097152  
Sons, £0 0 0 1/4194304  
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Sons, £0 0 0 1/134217728  
Sons, £0 0 0 1/268435456  
Sons, £0 0 0 1/536870912  
Sons, £0 0 0 1/1073741824  
Sons, £0 0 0 1/2147483648  
Sons, £0 0 0 1/4294967296  
Sons, £0 0 0 1/8589934592  
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Sons, £0 0 0 1/2199023255552  
Sons, £0 0 0 1/4398046511104  
Sons, £0 0 0 1/8796093022208  
Sons, £0 0 0 1/17592186044416  
Sons, £0 0 0 1/35184372088832  
Sons, £0 0 0 1/70368744177664  
Sons, £0 0 0 1/140737488355328  
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**STOCKPORT** For excavating, sewerage, forming, and flagging, No. 1 Passive, Dile street, and six other passages and streets, for the Corporation. Mr. Jno. Atkinson, Borough Surveyor, St. Peter's Church, Stockport. — [W. Bradhurst & Co. £355 2 1] For 18 1/2 ft. Stockport. — 348 5 10  
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For F. A. School.

J. Clowes & Barks ..... £185 10 0  
W. Smith ..... 175 0 0  
G. Goldstraw Ipton, Stoke-on-Trent ..... 157 15 3  
Ipton and Berkhamsfych.  
G. Goldstraw ..... £156 17 2  
Clowes & Barks, Ipton, Stoke-on-Trent ..... 159 10 0  
\* Accepted.

**SWANSEA**—For the formation and sewerage of a street and back lane, on the Mirror field, Uplands, for Mr. David Trevelian Jenkins. Messrs. John M. Lender & Son, architects. —  
J. & F. Weaver ..... £453 10 0 Wm. James ..... £354 7 6  
P. Jones & Son ..... 430 0 0 C. Hamay & Son ..... 335 5 0  
John Williams ..... 428 0 0 John Groves, St.  
T. Jones Davis ..... 420 0 0 Thomas, Swansea ..... 310 0 0  
\* Provisionally accepted.

**WOKING**—For converting two old cottages into a coffee tavern, at Woking Village, for Mr. H. J. Hill. Mr. Wm. G. Jones, architect, 3 Broadway, Woking. —  
J. Whitburn ..... £650 0 0  
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## The Orientation of Egyptian Temples.



UNDER the title of "The Dawn of Astronomy," Mr. Norman Lockyer brings before us the results of the investigations which he has been making for some years past on the position and movements of the heavenly bodies.\* From our point of view the book is mainly concerned with astronomy, mainly of interest in regard to any light which it may throw on the architectural usages of that ancient people; on the circumstances under which, and the objects for which, their temples were founded. But architectural interest of the subject is not at all very limited in extent. The structural style and the decorative details of Egyptian architecture are entirely outside the subject; they might have been just as they are had no stars existed, or had the elements of the heavens been matter of absolute indifference to the Egyptians. One architectural consideration directly connected with Mr. Lockyer's subject in regard to the reasons for the curious and apparently capricious alignment of the temples in reference to one another or to the points of the compass. This, however, has been made of considerable importance by modern writers on architecture. It involves the question whether architectural symmetry was regarded as a matter of any consequence by the ancients. Fergusson and others have taken a point, in an æsthetic sense, of the fact that the Egyptian temples, even when closely juxtaposition, were aligned with apparently intentional avoidance of symmetry; and upon this fact it has been concluded that the idea of the necessity of symmetry and parallelism in colonnaded buildings is an entirely modern superstition; that the Egyptians and the Greeks were influenced by no such idea; that rather they consciously avoided it; and the argument

has actually been made use of as a weapon of architectural criticism, in defence of modern arrangements which seemed otherwise indefensible. If it can be shown that all these apparently accidental or purposeless eccentricities of alignment in Egyptian and Greek temples were after all neither accidental nor purposeless—that they arose purely from the intentional laying out of temples in reference to the rising and setting of the sun or of special stars, the æsthetic aspect of the matter becomes totally changed. The ancient architects could then be no longer considered as indifferent to the alignment of buildings; on the contrary, they regarded this as of the greatest importance; only that the alignment was carried out in respect of the celestial bodies, and not in respect of terrestrial arrangement or symmetry.

Of course we admit that even from the purely architectural point of view this is only a secondary consideration. The grand effect of the hypostyle halls of the Egyptians; the fine artistic design of the open lotus capitals (for the closed or bud-like capitals we care little); these would be of just the same interest to the architect, whether the axis of the temple pointed east, west, north, or south, or to any of the intermediate points of the compass. On the other hand, the idea that these most ancient temples of the world were closely connected with the first systematic efforts of the human race to observe and register, as it were, the movements of the heavens, must give them a great additional interest in the eyes of all thoughtful people, and we should be sorry for any architect who was so taken up with considerations of orders, capitals, and decoration as to be indifferent to the new interest and meaning thus added to ancient buildings. Mr. Lockyer however, is rather too astronomical in his title and treatment of his subject. He seems to regard the Egyptian temples simply as star-pointers. He compares such a temple as Karnak to a telescope: "to keep the light that passes into the eyepiece of a modern telescope pure, we have between the object-glass and the eyepiece a series of what are called diaphragms; that is, a series of rings right along the tube, the inner diameters of the rings being greatest close to the object-glass; these diaphragms must be so made that all the light from the object-glass shall fall upon

the eyepiece, without loss or reflection from the tube. The apertures in the pylons and separating walls of Egyptian temples exactly represented the diaphragms in the modern telescope. What then was the real use of these pylons and these diaphragms? It was to keep all stray light out of the carefully-roofed and darkened sanctuary. . . . If we consider them as horizontal telescopes used for the purpose I have suggested, we at once understand the long axis and the series of gradually narrowing diaphragms, for the longer the beam of light used the greater is the accuracy that can be obtained."

Really we have not seen a more curious illustration of the proverbial "nothing like leather." To the mind of the astronomical writer it appears that all the array of architectural magnificence in the vista of an Egyptian temple—the impressive mass of the entrance pylons, the colonnades of the fore-court, the grand and mysterious effect of light and perspective in the hypostyle hall—is nothing more than the parts of a gigantic telescope fitted to carry a beam of light along its central axis. What then were all these architectural grandeurs for? If Mr. Lockyer had discovered a long series of passages on the same axis, confined between plain parallel walls approaching each other closer and closer as they receded from the entrance, we might agree with him in regarding this as a huge built telescope; but to reduce the whole varied and impressive architectural treatment of an Egyptian temple to nothing more than a scientific instrument; to ignore entirely its disposition for the production of architectural effect; is one of the most curious examples of putting the cart before the horse that we have ever met with in print. In one passage in his book the author laments that every archaeologist is not also an astronomer, i.e. that he is not capable of appreciating and examining the relation of a temple to star observations, as well as its place in the history and development of architectural art. The criticism is just, if we regard it as proved (and we think it is) that ancient temple-builders did align their buildings, frequently if not always, with relation to the rising or setting of the sun or of various stars. But surely the architect and archaeologist may turn round and tell Mr. Lockyer that after all there is some interest in an Egyptian temple, beside and apart

\* "The Dawn of Astronomy: A Study of the Temple-ship and Mythology of the Ancient Egyptians." By Norman Lockyer, F.R.S., &c., &c. Cassell & Co., London, Paris, and Melbourne. 1894.



from its astronomical alignment, and that no builders of any age would ever have gone to the enormous expense and labour involved in the planning of such grand architectural effects, if they had not had the desire to produce such effects paramount in their minds.

Not to fall ourselves into the same condemnation of being one-sided in our interest in the subject, let us say that we have followed out the purely astronomical portion of the book with the greatest interest, and fully recognise that it throws a new light on many points in connexion with the study of ancient architecture. We must confess that, for a book written by an eminent man of science, we find it rather deficient in concentration and scientific method; there is a good deal of repetition, and occasionally a want of logical connexion; we seem to be jumped from one point to another in rather a haphazard manner; and the impression left on the mind of the reader is that although the collection of the materials has been a matter of slow and careful study, the actual writing of the book has been rather hurried, and that if another edition is called for it would benefit by a good deal of re-writing, re-arrangement, and concentration. Nor do we quite understand for what public the book is written. If it is written for scientific students, a good deal of the explanation as to the movements of the earth in relation to the sun and stars, and the means of measuring and identifying the apparent position of stars at different epochs, is surely rather superfluous. If this is done for the sake of the general reader, we fear the author is counting on a degree of interest and enlightenment on the part of that noun of multitude which he is hardly likely to meet with. The "lending-library public" seeks mainly to be amused, and is not likely to take the trouble to follow out Mr. Lockyer's reasonings, even though expressed so that he who runs may, if he be so minded, read a good deal out of it. However, we may point out that for unscientific persons who take any interest in astronomy and its methods there is here a good deal of information put in a form comprehensible to the unscientific intellect which will take the trouble to give its mind to the problem.

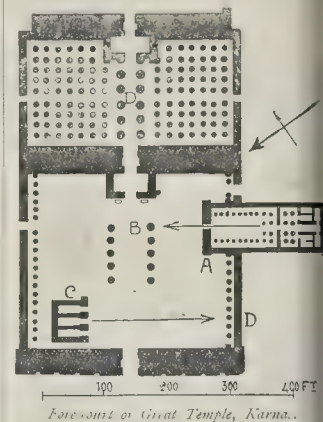
What strikes us most in this introductory portion of the work is the vivid manner in which the author brings before our imagination the manner in which the problem of the moving heavens must have presented itself to the minds of the early inhabitants of this globe; the awe and wonder which must have attached to it in the first instance, and the interest arising from the slow and bit-by-bit discovery of a law regulating the motions of the stars and sun, of the recurrence of places and periods, and especially of the immense importance and mystery attaching to the daily rising of the sun, the mechanical cause of which was totally unsuspected and beyond the conjecture of the time. Small wonder, indeed, that temples should be dedicated to the sun, that their shrines should be arranged so as to catch in their innermost recesses the first and last rays of that great luminary, the setting of which was like temporary death to the world (especially when the means of artificial lighting were probably so restricted), and its rising like the awakening of all creation once more for another day. It is difficult for us, to whom the main facts of astronomy are almost a part of our school lessons, to put ourselves in the position of those to whom all the causes of the celestial mechanism were hidden in obscurity; and Mr. Lockyer's book brings out this position with remarkable effect. Occasionally, it is true, the author goes off at a tangent into momentary little paradoxes which rather weaken the effect of his presentment, as when he observes that our methods are after all more nearly connected with those of the ancient Egyptians than we are in the habit of supposing. "I assume," he says in one place, "the personification or deification of the sun; I indicate special orientations of buildings devoted to

the worship of the sun at one time of the year or another. But really both these things, though they seem improbable, have been carried down to our day, quite independently of any question relating to Egypt. There is nothing new about them at all; there is nothing really strange. When we go into an observatory we think nothing of turning our telescope towards Venus, or Jupiter, or Mars. Here we have the dedication of the planets." This is really playing with the reader. What possible analogy is there between an act of worship and a scientific investigation? We do not build our houses to face particular stars for reasons of worship or ceremonial. We are only particular about their sun aspect for sanitary reasons. The orientation of our churches is a ceremonial idea, no doubt; though, as Mr. Lockyer is careful to point out, it is, in this and some other northern countries, an inverted orientation. In the Egyptian sun-temple it was the entrance-end, not the sanctuary-end, which faced the sun; and it is certainly significant that in Italy, the earlier land of the Christian church, the Egyptian and Greek orientation is kept up, and the entrance of the great Roman church still faces the east, not the west. Orientation to the west, to receive the rays of the setting sun, was not, however, unknown in ancient temples, though not the most common.

For the chain of reasoning by which the author shows the probability that certain stars were the objects of orientation; the manner in which their connexion with the names and representations of special Egyptian deities is traced; the calculations whereby it is shown that temples which cannot now be identified with the position of any special star were nevertheless correctly orientated towards them at the time the buildings were set out, we must refer the reader to the book. Many of the instances given seem conclusive, and can leave no reasonable doubt, in the mind of the reader who follows them out, of the reality of the facts. We may also draw attention to the significance of the reason suggested for the direction of the temples specially to the rising and setting of the stars and sun. One reason no doubt would be that to observe the star from the depths of the temple it must be caught when it was low in the sky and nearly on the horizontal line of the temple; but a more important reason, Mr. Lockyer suggests, was that in the early days of astronomy the horizon line afforded the sole possibility of measuring with any degree of accuracy the position of star or sun, the extent to which it had shifted, its apparent position in regard to the earth, and the day on which the sun returned to its annually observed position.

While admitting, as every one who reads the book attentively must we think admit, that the author has proved that the stellar orientation of temples was a frequent practice, and that a great deal of significance was attached to it in certain cases, it strikes us that his subject has carried him a little too far; that he attempts to prove too much, and that his reasons are not always adequate explanations of the peculiarities which they are supposed to explain. We may take as an instance the author's reasoning as to the Karnac group of temples. He reproduces Lepsius's general plan of the site, and after observing that at first glance it seems to negative the idea of star worship, inasmuch as several of the smaller temples have their axial line of sight interrupted by some part of the walls of the great temple, he argues that the great temple was later than these interrupted temples, and that in one or two instances it was the actual intention to interrupt the line of sight of these earlier temples, in order to nullify a worship which it was desired to supersede. We give the plan of the forecourt of the great temple as an illustration of this argument. It is generally recognised that this forecourt was the last portion built, and that the two small temples A and C were in existence before it was built. Here, says the author, the

axial line of the temple A is interrupted by two of the columns (B) in the centre of the court, and the axial line from



temple C\* is stopped by the boundary wall (D) of the fore-court opposite. Surely this is rather far-fetched. Surely it would be more likely, and more in accordance with the general processes of religious fanaticism, that a builder who wished to extinguish the worship of temples A and C would have taken the simpler and more drastic method of pulling them down altogether, instead of building his enclosure wall up to the sides of temple A, and leaving temple C as an eyesore to spoil the symmetry of a great architectural feature of his own. To our thinking it only needs a glance at the plan to lead on to the conclusion that those two small temples were retained for some definite reason which appealed to the mind of the builder of the forecourt, and that if he had wished to supersede them he could have done so in a much more effectual manner, without leaving them to interfere with his own architectural coup d'œil. Another point in the plan strikes us still more. We should say that if anyone were looking at the general plan of the site with the idea of problems of alignment present to his mind, the very first thing that would strike him would be the well-known peculiar position of the pylons in front of the small Karnac temple. Here we have a row of sphinxes extending from each angle of the front of the temple, parallel with its axis, forming a courtyard closed at the outer end by the great entrance pylons; which pylons, however, are placed at an oblique angle across the lines of sphinxes. Why were these pylons placed obliquely? That is one of the first points we should have expected to have explained, but Mr. Lockyer does not even notice it, and his "sight-lines" drawn on the map suggest no explanation of it at all. One cannot help seeing, also, that such an arrangement is quite at variance with the "telescope" idea of the temples.

We come to the conclusion, therefore, that there are more points in regard to the alignment of Egyptian temples than the star orientation theory will account for. It accounts for a good deal, and Mr. Lockyer has added a new and very important chapter to Egyptian archaeology, besides producing a book which is of the greatest interest, and will probably open the way for further investigations in the same field.

We may conclude by calling attention to one practical point which is of importance to any one who may be carrying on the same line of investigation in Egypt or elsewhere; viz., that it is of little use, and often misleading, to test any theories of orientation of ancient

\* Can this be called a temple? It seems more like the remaining *cella* of a temple from which the approach had been removed.

† Only the inner portions of these pylons exist, but there is enough to show the arrangement. The remainder was very likely formed of earth or unburnt brick.



ples in relation to magnetic north, not only because this varies at different times and different places, but because the ancients, so far as we know, had no compass, and nothing of magnetic north, and must have settled their orientation in reference to true north. Mr. Lockyer draws special attention to the difficulties and the loss of time he has experienced in making investigations, owing to the frequent turning down of magnetic north instead of true north on what were in other respects the most reliable plans available.

#### REPORT OF THE QUARRY COMMITTEE OF INQUIRY.

THE report of the "Quarry Committee of Inquiry" has just been issued as a Blue-Book. The inquiry was instituted by the Home Secretary for the purpose of ascertaining "the conditions under which the quarrying of stone, limestone, slate and clay is conducted, with the object of diminishing the proved dangers to the life or health of workpeople engaged therein." It must be premised that the inquiry relates only to open quarries, as underground workings come under the legal definition of mines. The Committee visited quarries in thirteen counties in England, seven counties in Wales, and five in Scotland, but their inquiries were remarkably incomplete. For instance, the total number of men employed in quarrying stone, limestone, and slate in the thirteen English counties visited by the Committee, was, according to the Census returns for 1891, only 11,930, while, in the counties of Lancashire and Yorkshire, the number of which was visited, the number was 641. Again, the Committee sat to receive evidence on five days only; one of these days was occupied in taking the evidence of Dr. Ogle, the late Superintendent of Statistics at the General Register Office, while the remaining four were spent in taking evidence from quarrymen in North Wales, three days at Menai Bridge and one day at Penmaenmawr. During these four days no less than 3,386 questions were asked by the Committee, and the replies of the witnesses—doctors, quarry-owners and managers, and workmen—contain much useful and interesting information, and it is certainly somewhat strange that a similar method of inquiry was not pursued in at least one district in England (say the West of Yorkshire), and in one district in Scotland (say Aberdeen). The report of the Committee really contains comprehensive information respecting the Welsh slate industry only. The total number of stone and slate "quarriers" in Wales is given as 2,227 in the census returns for 1891. We gather from the report that on an average 335 persons were employed at the open slate quarries of Carnarvonshire during the ten years, 1883 to 1892, and that there were in this period 128 deaths from accidents, equivalent to an annual death-rate of 1535 per 1,000 persons employed. This is 0.245 less than "the average death-rate from accidents per 1,000 persons employed at all the mines of the United Kingdom." At the Mountsorrel quarries, Leicestershire, where about 500 men are employed, the annual death-rate from accidents has been 1.67 per 1,000 men employed. The highest death-rate recorded in any quarry in England is that for the Manchester Ship Canal Company's quarry near Runcorn—namely, 14.56, but this average is calculated on the experience of 10 years only—3 deaths in two years—and on the basis of calculation is therefore much too narrow for the result to be accepted as normal. The highest death-rate recorded in any quarry in Scotland is no less than 1.66, but as this is based on the working of a quarry where only 30 men are employed—deaths in 10 years—it also must be considered abnormal.

The evidence given at Penmaenmawr and Menai Bridge seemed to show that the mode

of life of the Welsh quarrymen—that is to say, their clothing, their houses, and their food, but especially the last—had more to do with their health and mortality than had their occupation. Dr. R. H. M. Roberts declares "I have no hesitation in stating that I consider this occupation to be very healthy—indeed exceptionally so." He added, however, that the men, on account of their manner of life, "are far from doing justice to the healthy character of their work and the healthy position of the quarry." Many of the men lived two or three miles from their place of employment, and were frequently caught in the rain on the way; on reaching the quarry they either set to work in their wet clothes, or, if the rain continued, crowded into the boiler-house to dry themselves. Either of these courses tends to produce lung diseases. Again, the houses are frequently small, ill-ventilated, and terribly overcrowded. The evidence of Wm. Gadlys Williams as to his own house gives a picture of overcrowding and of stifling sleeping accommodation which reminds us of London slums and canal-boats. His house, in which seven persons dwelt, contained two rooms on the ground floor and three on the first floor. These three had been formed by Williams out of one moderate-sized room; the largest of them was three yards square, and the others were each two yards square. In answer to a question as to the height of the rooms, Williams replied:

"They are only 2 ft. high in the lowest part."

"And how much in the highest?" was the next question.

"Perhaps 6 ft."

"You have a bed in each of those three rooms?"

"No, only in two of them."

"How many are there sleeping in those beds, as a rule?"

"Two in each."

Two persons, therefore, slept in a room which contained only 324 cubic feet of air, and two others slept in one containing actually only 144 cubic feet. If we deduct the space occupied by the sleepers, and the bed and other furniture (if any), these figures, lamentably small though they are, will be still further reduced. Probably the actual amount of air in the smaller room would not exceed 60 or 65 cubic feet for each occupant. When we remember that about 3,000 cubic feet of air are required for each person *per hour*, if the room is to be kept "sweet," we can have some faint conception of the state of the air in the small attic after it has been occupied for seven or eight hours. The minimum amount of space allowed by law for common lodging-houses is far in excess of that in this Welsh bedroom, namely, 240 cubic feet per head, while for barracks the amount required is 600 cubic feet. No wonder that the Welsh quarrymen suffer largely from lung diseases if such stifling lairs as this are common.

The evidence also showed that the food of the men lacked variety; morning, noon, and night, it was white bread, butter, and tea. The doctors condemned this excessive tea-drinking very strongly and recommended the use of buttermilk, and also of brown bread, porridge, and vegetables. The following food table has been compiled from the evidence of a quarryman:—

1. Breakfast (before leaving home)	Tea or coffee, bread & butter.
2. Luncheon .....	Tea, bread and butter.
3. Afternoon tea ...	Bread and butter, and sometimes tea.
4. Dinner .....	Potatoes & meat (bacon, mutton or beef).
5. Supper .....	Tea or coffee, bread & butter.

The Committee in their report allude to this question of food, and recommend the Welsh quarryman to "copy his brethren in Scotland and elsewhere, and make use of a more varied diet, such as porridge and milk,

broth with vegetables, &c., and be careful to avoid stewed tea, for we [the Committee] were struck by the fact that the physique of the Scotch and Cornish quarrymen was decidedly superior to that of the Welshmen."

It seemed to be admitted by the workmen who gave evidence that a considerable number of accidents in the quarries resulted from the carelessness and disobedience of the workmen themselves. The most prolific causes of accidents were blasting, and the falling either of rock from one gallery or level of the quarry into the one below, or of the "overburden" from the top of the quarry.

In order to lessen the dangers from these and other causes, the Committee have drawn up a code of "special rules," divided into six sections as follows:—I. Safety of Quarries. II. Blasting. III. Access to Quarries. IV. Machinery and Plant. V. Duties of Officials and Workmen, and VI. Ambulance. But as these rules cannot, under the existing law, "be enforced at quarries which, owing to the absence of machinery and to the fact that no women, young persons, or children are employed, are neither 'factories' nor 'workshops,'" the Committee consider that further legislation is necessary in order to bring these smaller quarries under the law. It may be added that the quarry-owners as well as the men seemed favourable to the imposition of most of these rules, but the men apparently desired in addition the appointment of a Government Inspector to visit the quarries every month or two.

The evidence revealed the fact that privies or other closets are conspicuous by their absence, and that the accumulation of filth in some parts of the quarries was a source of pollution to the water in the vicinity. The Committee make no rule about this important matter, as rules are already provided in the Factory and Workshop Acts.

In conclusion, reference may be made to the evidence of Dr. Ogle, already mentioned. He found from the statistics of the General Register Office that the mortality of quarrymen in England and Wales between the ages of twenty-five and sixty-five was very high—*i.e.*, 12 per cent. more than of "all males" of the same ages, and this excessive mortality he attributed to the inhalation of stone-dust. He showed that fishermen and quarrymen ran almost exactly an equal risk from accidents, but that the deaths from phthisis and diseases of the respiratory organs were, among the former class, represented by the number 198, while among the quarrymen the figures were 582. Other dusty industries gave figures for these diseases as follows:—Carpenters and joiners, 337; wool-workers, 462; cotton-workers, 543; Sheffield cutlers, 760; file-makers, 783; pottery-makers, 1,118; and Cornish miners, 1,148, the highest figure of all. Dr. Ogle's figures show that quarrymen are an abstemious class, or that their hard physical labour prevents much of the injurious effect which alcohol has on the human system; thus, if the average deaths from alcoholism of "all males" be represented by the number ten, those of quarrymen would be represented by five, while brewers would figure at twenty-five, and inn-keepers at fifty-five.

The evidence of the doctors in Wales seemed to prove that the quarry-dust has no appreciable ill-effects on the workmen, but Dr. Ogle's testimony is strongly in favour of the idea that it has a great effect. And as his figures cover a wider series of facts than did the evidence in Wales, it is probable that they are more reliable. Be that as it may, the Committee acknowledge that Dr. Ogle's "conclusions are somewhat surprising." In order to verify or disprove them, they recommend that further investigations should be made. Certainly the enormous number of deaths from lung diseases, both among quarrymen and other workers in dusty occupations, calls for further inquiry. It will be well repaid if it results in the prevention of even part of this great amount of disease and death.



# JAPANESE WORK AT THE BURLINGTON FINE ARTS CLUB.

**T**HE exhibition of Japanese lacquer and metal work at the Burlington Fine Arts Club is a very fine and interesting one, and represents Japanese art in its best light, as the art of decorative applied ornament. The amount of delicate and beautiful workmanship collected in the room is very remarkable, and the collection affords an illustration of the endless diversity of decoration which may be applied to the same class of objects, as in the cases of sword-guards, and in the numerous examples of the small boxes called *inro*. We do not know, however, that the artistic interest of the objects exhibited always runs parallel with their commercial or collector's value, as it may be called. There is an artificial taste in these things among collectors, and the pieces which are most valued as examples of lacquer are not always the best designed, and sometimes exhibit beauty of workmanship rather than beauty or fitness of design. Speaking generally, we should place the metal-work portion of the collection a good deal below the lacquer-work in purely artistic value. The want of architectonic perception, characteristic of the Japanese mind, is much more apparent in this class of work, in which constructive design plays a part, than in the decoration of flat surfaces. In spite of remarkable beauty of manipulation and detail, the forms of Japanese metal-work are often not good, they are too wriggly and too unquiet, and deficient in purity of line and in the sense of form. The bronze casting, No. 3 in Case iv. for instance, described as "Stand of Three Tortoises and Waves," may be very valuable to collectors, but it is badly designed; the tortoises which form the feet hang on to the design in a very unconstructive manner. In Case v., No. 46, we have "A Falcon Standing on a Rock"; the bird is splendidly designed and executed, but the rock is a mere mis-shapen lump of metal, with no decorative value whatever; and next to that (No. 45) the flower vase, a big piece of bronze in the shape of a piece of bamboo realistically imitated, is about as bad art as can be, and a thing no one who knew anything of decorative design would look at—if it were not Japanese. There is so much foolish and uncritical admiration of everything Japanese at present, that it is necessary to draw such distinctions, and to remind people that a thing is not necessarily admirable in an artistic sense because it is finely made, or even because it is Japanese. Case xiv. contains some of the most really beautiful work in the exhibition. No. 2, a small perfume box, is covered with beautifully designed flowing conventional foliage in lacquer, and the small box No. 4, with a broad band of arabesques and cherry flowers running round it, is equally admirable. Close to these, to illustrate the weakness as well as the strength of Japanese design, is a perfume box (3) decorated with a lacquer imitation of "the wooden saddle formerly in use in Japan." How is this decorative or suitable to its position? Among the numerous things to be specially admired (most of them among the smaller objects) we may mention the sword-guard formed of two fish, in silver (Case i.); the iron vase in Case iv. (16), of much better and finer form than most of the metal work; the bowl in Case v. (24); the damascened globular vase in Case vi. (4); the small box in the same case (5) with its delicate diaper of silver (observe the effect of the bright little points of metal in the centre of each division of the diaper); the *inro* with red lacquer ground, 12, in Case xi., and No. 15 in the same case, with its chrysanthemum decoration; the small box, 28 in Case xii., also Nos. 30, 32, 39, and 40 in the same case; the black lacquer *inro* 48 in the same case, in which the design is shown only by relief; the small oval box, 23 in Case xiii.; also, for bad design this time, the incense box, No. 30 in the same case, with a lid

decorated with a landscape and an imitation of folded paper mixed up together (!); the box No. 42 in the same case; the shrine, 15 in Case xiv., with its beautiful diaper ornaments; the box, No. 17 in the same case; No. 39 also, a kind of double box in the form (on plan) of two shells partly let into each other, one of those charming fancies in design which we meet only in Japanese work; the incense box, 24 in Case xvi.; the nest of boxes, 28 in Case xvii. (observe the beautiful tone and design of the green lacquer in the lower portion); the box decorated with maple leaves, 34 in Case xviii.; and the splendid tray, 23 in Case xix., formerly belonging to Beckford. The foliage ornament in the angles of this tray is quite a study in itself.

## NOTES.

**T**HE proposal of Princess Christian to establish a school of applied design for women is an admirable one. We are glad to see from the prospectus that it is proposed, after the first instruction in drawing, to put students through the study of the various styles of architecture, as a preliminary to the study of design for application to special materials, on the ground that all applied design is more or less connected with architecture. This is a recognition of a point which is often lost sight of, and lady artists are often especially deficient in this knowledge of architectural detail and effect, architecture being generally considered less a woman's subject than a man's. Mrs. Hopkins, of New York, gave her experience as to the results of a similar attempt there, which appears to have been eminently successful in a commercial sense; the school is self-supporting, and three-fourths of the sum raised to found it has been returned to the subscribers. In the great need in the present day of further professional opportunities for women to gain an independent living, nothing could be more suitable than the subject of applied design; and it is one of the few fields of human labour which cannot at present be said to be overstocked.

**I**T is somewhat ludicrous to find that the first discussion of what is in fact, though not in name, a new Session of Parliament, is the question of contracting out under the Employers' Liability Bill. Though the subject is one of importance, it is little short of a public scandal that the Legislature should not have by this time arrived at a satisfactory solution. The Government have now somewhat given way in favour of the principle of allowing members of mutual insurance companies to contract out. They sanctioned an amendment to allow members of existing societies to contract out for three years after the passing of the Act. But if it is right that this principle should continue for three years, why not for ten? The fact is that common-sense and the general opinion of the country are in favour of a system of contracting out, if, as is the case under the usual schemes, the workman obtains adequate compensation for all injuries. By allowing a period of three years' grace the Government have shown that they do not really believe in their own limitation of freedom of contract, and the vote of Tuesday last showed also that the House of Commons does not like the view of the Government.

**W**E are glad to see that the German Archaeological Institute has issued an official guide to Pompeii. Such a book has been long wanted, and Dr. August Mau was obviously the right person to undertake it. Not only has he a detailed personal knowledge of the excavations that have gone on there, which perhaps no second archaeologist possesses in the like fulness, but he has had abundant practice in lecturing and demonstrating *in situ* to parties of German scholars and schoolmasters, and knows how to put his vast stores of information in intelligible form. The book is of compact and

convenient form. It has, of course, a plan of the town, and it has, further, twenty-two illustrations, giving, among other matters, mar restorations, and here and there a reproduction of some now lost buildings, with other works of art. Dr. Mau gives in his introduction an admirable summary of the history of Pompeii before the eruption, of the various periods of excavation, down to the present day, and a general account of the paintings, mosaics, inscriptions, the periods of architecture, and the materials and methods employed. It is high time that the *Rolle* guide-book at present in use among English visitors was superseded, and it could not be better replaced than by an adequate translation of the present volume.

**W**E have on several previous occasions referred to the proposed establishment of German studios and art workshops at Rome. According to our contemporaries the *Deutsche Bauzeitung*, an opportunity now offers itself of purchasing the ground of the Villa Strohl-Fern, close to the Porta del Popolo, of which it is expected that the German Government will make use. The site, by reason of its central position, is well adapted to the purpose intended, and has ample room for the erection of studios for painting and architecture, as well as workshops for statuary and handicrafts. Moreover, the spacious and well-laid-out gardens, with a magnificent view of the city of the Campagna, and the mountains, will afford every advantage for the study of landscape, and will also permit of drawing from living models in the open air. The importance of the latter point is much emphasised by Professor Prell, who is associated with Professor Meurer and the other members of the German Artists' Union at Rome in the furtherance of this scheme. It is intended that the use of the studios and workshops shall be free to the holders of Government studentships, whilst other German artists will have to pay fees. It is of interest to note that the institution is to be wholly unacademic, and that its management will be in the hands of an official subordinate to the German Ambassador at Rome.

**T**HE case of Knight Bruce v. Judge, which was decided last week, seems to have caused some surprise. It cannot, indeed, be said to have been decided, for the defendant when it came into Court, did not contest it. The action was brought by a landlord to recover two quarters rent of a house at Sandgate which, owing to the subsidence of the foundation, had become almost uninhabitable. But it is a very old principle of English law that there is no implied agreement by a landlord that a house will remain inhabitable during a tenancy. No doubt a curious and interesting legal discussion might be produced on this point, but it is obviously contrary to common-sense that if by no fault of a tenant a house ceases to be habitable, the owner should continue to receive rent. If the building is destroyed by some commotion of nature the permanent owner should be the person to suffer, not the temporary tenant. The fact is, however, that cases of this kind of hardship are not numerous, and so no attempt has been made to change the law. But as to the law at the present day there can be no manner of doubt.

**W**E have received samples of a silver-white alloy, manufactured under the name of "Silvinit," by the "Silvinit Metal Company." The material seems to be chiefly composed of aluminium. The alloy has great lightness, silvery lustre, malleability, and considerable ductility, and although comparatively soft is tough and strong. In decorative work it might often be used with advantage, either in its natural colour, which is not easily tarnished, or painted with oil colours, which it "takes" well. The manufacturers also claim that it enamels well, but if so, the enamel material applied must be fusible at an exceptionally low temperature, as



metal itself softens and fuses very readily. the same reason we can hardly sustain suggestion that it would be a good thing material in place of corrugated iron. the event of fire a Silvinite roof would lapse very quickly, in this way causing ably a more complete wreck than would ult if iron were in use. Sulphuretted drogen does not tarnish the metal, even prolonged exposure. Ammonia, on the er hand, distinctly affects the surface of metal, while caustic alkalis and dilute acids rapidly dissolve it. It is well derstood that in gas-lighted buildings much nages often done to the decorations, metal-ork, and pictures by the sulphurous and phuric acids which result from the oxida- of the sulphur compounds in the gas, aluminium or Silvinite would not be mpt from this corroding influence, if we judge from the results of test-tube xperiments. Vegetable acids, such as acetic, not seem to affect the metal appreciably; whether prolonged action, aided by icate wetting and drying by exposure air, will produce corrosion, time alone prove. We note, however, that the ers claim that the metal is well pted for use in the construction of s, bar-fittings and culinary utensils. The ular sent out with the sample is far too ar in its statements and enthusiastic in tenor. It would have been more satisfy- ing if exact details as to the strength and abilities of the alloy, vouched for by well- own experts, had been supplied. There is oubtedly a large field for this valuable al to occupy, but that it will really erse any of the other metals in common is not likely. The manufacturers claim t "steel and other castings attain a degree of fluidity by an admixture of nite." This is a point about which more ailed information would be interesting, we remember that Mr. John H. Dagger, his paper read before the British Associa- of 1889, seemed to think it very doubtful ether aluminium does really increase the dity of properly-made steel.

HE lease of No. 20, Bishopsgate-street Without is offered for sale. The mises were built in 1839, at the corner Devonshire-street, and, it is supposed, up part of the site of what was com- ly called "Fisher's Folly." The "Folly" been built by Jasper Fisher, one of the Clerks in Chancery, whose lavish ex- diture upon his house and gardens in- ved him in ridicule and insolvency. The property passed to Edward, Earl of Oxford, d High Chamberlain to Elizabeth. Here received the Queen as his guest, giving so the story goes, the first pair of per- ned gloves brought into England. Having et become a town mansion of the Caven- des, who, it seems, lived in the parish of Henry VIII., it was occupied by William, second Earl of Devonshire (who d there, 1628), and his son, the third l. But about fifteen years before the er's death (1684) it had been converted a while into a conventicle, to whose gregation Butler compares the Rump iament.\* After the death in 1689 of abeth, Countess of Devonshire, whose William III. advanced to a dukedom, bert Murray, founder of the Club of mmerce, opened a credit bank there. In junction with William Dockwra he had ablished at his house—formerly Sir hard Abdy's—in Lime-street, a penny it, which they began in 1680 with four iveries, on foot, a day. At the beginning of century Devonshire-square and, we gather, Friends Meeting-house and Institute, were it over part of the garden site, together h Cavendish-court and Devonshire-street. e are credibly informed that the fine old nson, No. 3 in the square on a parish n made in 1866, which was pulled down ut sixteen years ago and rebuilt as No. 1,

was Devonshire House. Sir Francis Baring, Bart., father of the first Lord Ashburton, lived in the square in 1803.

IN connexion with the proposal to rebuild Swansea church, it may be of interest to mention that the present church, dedicated to St. Mary the Virgin, replaces one of which the nave and aisles fell down in 1739; but it retains the chancel, with the square south-east tower of the earlier structure. Some of the old monuments, too, were preserved at the same time. They comprise the altar-tomb (in the Herbert, *olim* St. Anne, chapel), with effigies, of Sir Mathew Cradock and his wife, the Lady Katharine, a daughter of George, second Earl of Huntly, and Perkin Warbeck's widow. Another was that of the redoubtable Sir Hugh Jones and Baud, his wife—a black marble one, with brasses, in the chancel. Sir Hugh was made a Knight of the Holy Sepulchre (1442), having fought under John Palæologus II., Emperor of Constantinople, "ageant the Turkis and Sarsyns in the plies of Troy, Grece, and Turkie." Returning home he became knight-marshal of England under John, first Duke of Norfolk, slain on Bosworth Field.

IN the Dudley Gallery Art Society's Exhibition the best things are among the smaller sketches and studies. The larger works in this gallery are mostly in a very mannered style. Among the small works those of Mr. George Marks are all good; Miss Nora Davison has some capital sketches of shipping scenes; "Low Tide, Whitby," by Mr. Reginald Jones, is a fine work, taken apparently from a boat in the harbour, the town on the one side in shadow and on the other in light; Miss Bernard's rather slight studies of landscape effects are fine; Mr. David Green's ship subject, "Nearing Home" is good, and also a "Moorland Road" by the same artist, hung beneath it; and Mr. Block's admirable still-life sketches of books. There are a few architectural subjects, of which Mr. Coleridge's "Durham" is the best; Mr. Medlycott's "Venice" is good in colour, but the buildings very badly drawn. Water-colour artists seem to have a spite against St. Paul's; there are three drawings of it here, and they are all bad; in one (8) the dome is shown of the same colour as the masonry, which it never can appear in any light, and in No. 69 the dome is so badly drawn as to be positively painful to the eye. How is it that so few painters seem able to draw a dome in perspective; is it inability, or sheer carelessness? Of Mr. Walter Severn's large drawings we prefer "Beech Trees" and "Sand Dunes, Bamfborough"; some of the others are painfully mannered. Another architectural failure is Mr. Williamson's "End of Parliament-street," in which the towers of the Houses of Parliament are simply libelled. Painters should really learn a little about architecture before they make it the main element in a picture.

#### THE ADVANCEMENT OF ARCHITECTURE.

ROYAL ACADEMY LECTURES BY PROFESSOR AITCHISON, A.R.A.—LECTURE III.

SEEKING the leagues before us the engineers have got in iron construction, it seems only natural that the young architects should say to themselves, What have we mainly got to do? and have answered the question in the way that seems most agreeable to themselves.

We have to make things pretty to look at, and to be able to sketch, so as to show our skill and invention. All knowledge, including that proper to the fine arts, is traditional up to the point at which living schools and individuals are improving on the past, or making perceptible alterations from it; and perhaps, with the exception of poetry, all the work in the fine arts is mainly collective; I mean by that, that it all starts from the groundwork of an average of the knowledge and tendencies of the day, each artist endeavouring to add as much personal flavour as he can; but the main conception belongs to the age,

except in architecture, where it mainly belongs to past ages. When an architectural student has made himself familiar with the forms of some past style, or styles, it seems delightful to him, if he has invention, and skill in portrayal, to sketch out the view of a church, a palace, or what not—say, Wordsworth's Architectural Vision, Chaucer's House of Fame, or Satan's Palace.

This sketch probably receives the admiration and praise of his fellow students; but if he shows it to some elder practising architect, his friend may praise his invention and his skill in sketching, but he will say, sketching is not of much use to an architect. Then the sketcher and his companions will think, if they do not say, that his elderly friend is a ridiculous old fossil.

What, however, can be more opposed to these aerial visions of beauty than the arrangements for meeting wants, propriety in the use of materials, geometrical proportions that are dry matters of calculation, and the mathematical formulæ of statics.

These students are like the young lovers who say "love is enough," and too often do not find among their associates even one who has the shrewdness of the girl in the ballad, who says—

"Will the love that you're so rich in make a fire in the kitchen,  
Or the little God of Love turn the spit, spit, spit?"

Lest any of you do not recollect the lines of Wordsworth, I quote them:—

"The appearance, instantaneously disclosed,  
Was of a mighty city—boldly, say,  
A wilderness of building, sinking far  
And self-withdrawn into a wondrous depth,  
Far sinking into splendour without end!  
Fabric, it seemed of diamond and of gold,  
With alabaster domes and silver spires,  
And blazing terrace upon terrace, high  
Uplifted; here, serene pavilions bright,  
In avenues disposed; there towers begirt  
With battlements that on their restless fronts  
Bore stars—illumination of all gems!"

Those "alabaster domes and silver spires," and those "towers begirt with battlements," when they become realities, have all to be slowly and laboriously built up, and, to say the least, if not built in accordance with the law of statics will fall down.

Let me revert to sketching. It is a charming accomplishment, and the young architect may make his sketch-book a museum of different architectural motives he has seen in old buildings. The possession of the skill of sketching does often contribute to some graces in design, but it has this drawback: whether it be from real object or from the imagination, the effect only is got, while what the architect wants to know is how the effect is produced, which his sketch does not tell him. In the case of an isolated feature that pleases him it is very well after he has drawn and measured it to take sketches from the eight points of view to see if it perfectly answer, or in what positions it fails.

Let us now look at another phase of the question. In the case of Satan's Palace, when the unhappy architects, who had already made their reputation in Heaven, had to design and superintend the building of Satan's Palace, they had no longer to deal with jasper and beryl, with sapphire, emerald, and diamond, but with metal, and probably knew that it was not necessary to make the golden columns and architraves quite so massive as the former jasper ones, and that metal architraves would carry a good deal more than those of marble, and probably that pendentives were not wanted for the dome; but besides this they would find that new proportions and new methods of adornment were wanted to excite the admiration of even the fallen angels. It is quite true that architects' buildings in the present day hardly ever fall down, as they used to fall in Romanesque, and sometimes in Gothic days, but partial disfigurements often take place, as they did so constantly in Gothic buildings, from arches and vaults not being properly abutted, and though these are not like the awful catastrophes of falling, they cause annoyance, grumbling, and expense.

Sta. Sophia and St. Peter's may be cited as examples of imperfectly-designed work, causing continued outlay and anxiety from their first building, owing to the incomplete knowledge of the architects; even in our time Salzenberg made extensive reparations to Sta. Sophia. Savage, the architect who built St. Luke's, Chelsea, one of the earliest vaulted Gothic churches, had a rough method of getting the shapes and pressures of his arches and vaults, by which he at least made all his vaulted structures stand. He got some clock chains and a board, put pulleys on a horizontal line at the distance apart of the springings of his vaults, and marked the height of the rise on the board, then let the chain down over the pulleys till it touched the mark, weighted

\* "That represent no part o' th' nation,  
But Fisher's-folly congregation."  
Hudibras, Part iii., canto 2.



the loose ends, and that gave him roughly the weight wanted at the abutments. If the vault had a lantern he put on a weight equal to the lantern, which gave the curve that would carry it, and of course he had to increase the weights on the ends.

Constantinople is subject to earthquakes, and it was from one of them that the first dome of St. Sophia first fell, but on its second falling, owing to subsequent earthquakes, Isodore's nephew rebuilt the present dome 20 ft. higher, so that it is nearly a hemisphere. The domical vault at Florence Cathedral is pointed, and has a small lantern, but at St. Peter's, St. Paul's, and St. Genevieve at Paris, the external domes were wanted to look like hemispheres.

Michelangelo had never noticed that a rope tied at both ends, to nails on a line, fell lower and its sides straightened, when a weight was hung on the middle of it, and consequently the dome of St. Peter's has only been kept up by putting iron bands round it and the drum.

Wren built his lantern on the walls of a lime-kiln, and made his outer dome of wood, the reason probably being that stone could not be afforded, but Rondelet managed to carry his small cupola at the top of the outside dome on the middle Catenary dome, which took the place of Wren's limekiln, and made his outside dome of stone; the present lantern is, I believe, of wood.

This, however, by no means exhausts the most commonplace arguments in favour of a knowledge of statics.

One of the great causes of our admiration of Gothic structures is their novel daring in construction, and this was gained by a practical acquaintance with the strength of stone, and the thrusts of vaults, and a desire to surpass former achievements; if we want to rival them, we must have at least the preliminary knowledge. The exact strength of most materials has been ascertained, and the engineers have applied, to utilitarian purposes, this knowledge of iron in the most marvellous way, and when the architects have acquired the knowledge, they will also have to apply it for emotional purposes as well. No Gothic cathedral, I believe, has a vault of so large a span as those of some of the Roman baths and basilicas; but Rome had the tribute of the civilised world for its expenditure, and armies of slaves to execute the work; while the Mediaevals were always short of funds, and were hampered by a thousand obstacles that were quite unknown to the Romans. And while the Roman vaults were solid masses from 5 to 6 ft. thick, the Gothic vaults were only a few inches; and even the main ribs were rarely half the thickness of the Roman vault. I merely instance this as an encouragement to you, to show you what the knowledge, skill, perseverance, and daring of architects can do with everything against them, for the Mediaeval architects built in sparsely-populated and poverty-stricken countries, and when we compare them with the Romans, they had to contend against the achievements of the largest, the wealthiest, the most populous, and the most cultivated kingdom of the world. If in some respects they were surpassed by the Romans, in some respects they surpassed everything that had been done before.

It is mere pedantry, if not incompetence, that makes us use old forms of construction that we should never think of using in a building for purely utilitarian purposes. Our business is to learn how to make our commonplace construction also answer for the effects we want to produce: this end is to be achieved by study and by effort. You may go to an engineer, and get him to make your hidden ironwork strong enough for its purpose, but directly you have to make your ironwork sightly or beautiful, and are ignorant of the laws of construction, and of the qualities of the material, you must either be guilty of immense waste or give it up. You cannot be constantly running to your engineer to see if you may pierce this, or thicken that, even if he can tell you; these points are mostly beyond his experience, and could not even be calculated, except at an enormous expenditure of time. Even now, you occasionally want shapely iron columns and stanchions, bressumers, and girders, strings of stairs, cantilevers, and what not, besides the whole class of grids, railings, and balustrades.

It is not that some architects cannot design these things, for you occasionally see a charming bit here and there that some benevolent architect has presented to the public. The plain reason of there being so little good ornamental ironwork to be seen is this: That the public will not pay the architect for designing it, for it takes three or four times as long to do as that in stone or wood, and therefore the public naturally does not get it. You

cannot often get a hansom cabman to drive you for two miles by offering him a halfpenny.

Fifty years ago an architect named William Vose Pickett, was so much struck with the possibilities of cast-iron, and, with the misfortune of architecture as an organised and progressive art, having stuck in the mud since Gothic times, that he actually laid out his money on a patent for his scheme of using iron. Something very like his proposed glazed porticoes may be seen at hotel doors and railway stations, only his were suspended; but his rain-guards to windows, which, by-the-bye, he called "sun-guards," consisting of a quarter of a sphere of iron and glass, have not yet come into use, except as old-fashioned window conservatories. Some of his ornamental inventions have not commended themselves to public taste; for instance, his bolts to connect the ironwork were to project, and to have a sort of pierced ornamental washer on them, some distance from the walls, whose shadows were to charm the beholder; but I am afraid they never did.

He must have written his fingers off to advocate the use of iron. I hope he is, or was, successful; but I never heard of any of his work, and one knows the usual fate of those who are sanguine over novelties. I give you a few extracts from his second book of 1845:—

"It has in various parts of this essay been explained that all the architectures practised throughout the successive ages of the world, are based upon the properties of the same material (*i.e.*, stone), and are therefore incapable of producing any *entirely* and *independently* new effects one from the other.

Numerous and important modifications in these effects amounting to *distinct* styles in architecture, have at several periods of history been produced. But it has long been held as a reproach to this country that (notwithstanding she may, perhaps, claim the merit of producing a variety in the Gothic style) she possesses no architecture—no style of architecture—that can be called *her own*. Babylon, Hindostan, Egypt, Greece, Rome, the Moors, the Mohammedans, and, if it be worthy of being so termed, the Chinese, have each an architecture bearing the name of the respective nations or people that produced it. But Great Britain, a nation which, in the vastness of its territories and power may justly claim to rank amongst the greatest of these, has no architecture of her own, and has therefore been condemned to adopt and imitate the practices of nations long extinct; but in which somewhat humiliating task she has hitherto been kept in countenance by the united practices of all Europe. Yes, England, in common with all Europe, in the nineteenth century (notwithstanding the immense difference in her state and circumstances) has no architecture but such as other and remote ages have left to her. The hidden treasures of the earth have been revealed to her in the greatest abundance; science has succeeded in bending the elements to her will, and in producing results almost surpassing poetic fancy to conceive; the mechanical arts have been essayed to an almost incredible extent, and still continue to advance with giant strides to the accomplishment of innumerable things unknown to our forefathers; and yet in architecture, the most valuable, the most important of the arts, no endeavour appears to have been made to conform to the spirit of the age, to adapt the numerous elements with which practical science has presented us, for the real advancement of art—the same materials, the same forms, the same methods of construction are employed. We are still where Greece, and Rome, and Mediaeval Europe left us, with the exception, that in attempting to avoid the mere mechanical imitation of their productions, we are most lamentably, continuing to depart, from the excellence to which they attained. . . . "He then quotes from a Mr. Kohl who says:—"Is it then quite impossible to escape from the Greek columns—the Byzantine cupolas—and the Gothic towers and arches? And are architects to be condemned for ever to ape this 'classical antiquity'? Are no different forms and shapes to spring out of the ground and brain of man? If we cannot conceive any such new form, that is no sign that such a conception can never start into life. The Greeks, in their time, could have had no idea of a *Gothic tower*, and the beauty of a *Gothic cathedral*. It is, indeed, singular, that we find none of our architects gifted, with sufficient imagination—that we could give him a commission to execute a building, in an *entirely new*, but no less beautiful and classical style" (Mr. Kohl's "Travels in Germany, Russia, &c.").

Mr. Pickett then says:—"Our author is somewhat premature in this remark. Had he been

aware of the discovery which, at the time of his writing, was already in existence, he would have paused before he included the whole of the nineteenth century in his otherwise just predictions of the opinions of posterity."

The late Ambrose Poynter, the architect whose beautiful sketches adorn the early volume of the R.I.B.A.'s "Transactions," and who was the father of the present R.A., and only died a few years ago, obtained the silver medal of the R.I.B.A. in 1842 for an essay "On the effects which should result to architectural taste with regard to arrangement and design from the general introduction of iron in the construction of buildings." I thought it might be interesting to you to hear some of his views on the subject of iron and of architecture generally, so give you the following extracts:—

"Whether we contemplate the architecture of the Egyptians or the Greeks, the stupendous piles of the Eternal City, the gorgeous monuments of the Gothic style, the mazy intricacy of the Alhambra, or the finished productions of modern Italy, the mind perceives in each and the adaptation of the means to the end, and the development of the spirit of the age and country in which, and for which, they were created, as these form the essential principle of the beauty of architecture. Now where shall we turn to find the beauty born from the spirit of the age and country, in the architecture of the nineteenth century? The very proposition at the head of this paper is an answer. In the nineteenth century we are in possession of a material of extensive operation, offering us new modes of construction, new proportions, the power of creating new forms and combinations, different from everything that has preceded them in art.

It is now sixty-two years since the erection of the bridge at Colebrookdale first revealed the capabilities of cast-iron in construction on a large scale; and during that period, science and art have marched hand-in-hand, with strides it is amazing to contemplate. But what has been effected with this new power? The Institute of British Architects are still at the enquiry 'what effect should result to architectural taste from the general introduction?'

In the real adaptation of cast-iron to architecture as an art, we are much where the Dorians were when they had placed four trunks of trees in a row with a tile upon each. There the Dorians order might have remained had the Dorians been of our stamp, and there it would have remained had trunks of trees instead of cast-iron been first used in construction in our time. Or perhaps the parallel will run closer if we compare ourselves with the ancients, when they first adopted the principle of the arch, since they combined it with architectural forms already established; as we shall probably seek to do with cast-iron when we begin to bestow our attention upon it. After sixty-two years' experience under circumstances through which a new and original style of architecture might have been developed, we are still where the Romans may have been when they built their Cloaca Maxima.

To what are we to attribute this stagnation; all our ideas as regards art in this point of view. Doubtless to the blind spirit of imitation and obstinate adherence to precedent (whether applicable or not seems of little importance) which characterises the architecture of the present day. Where cast-iron is to be used, the first requirement seems to be to keep it out of sight, or to make look as much as possible like something else. To impress upon it the character of a style would be more in the spirit of the ancients, whom we profess to adore.

Not that it is in the power of any man to stand forth and say, 'I will invent a style.' A style, like a language, must be the growth of time and circumstances; and who is to make the first essay in an age when precedent is 'the be-all and the end-all,' and when he who cannot command success cares not for the higher distinction of deserving it?

The fatal effect of this spirit on our architecture might be evidenced in various ways. What has been advanced on the subject of cast-iron is very far from being the strongest point in which it might be shown, but the argument must be limited to the question under immediate consideration. It may, perhaps, be further illustrated by a *reductio ad absurdum*. Let us suppose that the Greeks had possessed no marble, but had known the art of casting large weights of iron, and had thought proper to use it 'with regard to arrangement and design,' as it might have been used in their hands; we will further suppose that the art had been lost; we should, perhaps, still have looked upon the monuments of antiquity so



igned and constructed, in the same vulgar way with which it has been the fashion to conplate the Parthenon—as something to be imitated. How would our 'genius have been disappointed' (as the phrase is). How should we lamented at finding ourselves restricted to use of stone or marble, in which we should have sought in vain to reproduce the light forms of antiquity!

Instead of striking out original proportions and combinations adapted to our means, we should have found perfectly convinced that neither beauty of character could be created under the disadvantage of such materials, and abandon ourselves in despair to the construction of bare walls, monotony of which might now and then be saved by the crash of a public building, through laudable attempt of some classical genius to port it on Bath stone columns five and thirty meters high."

once had to examine some architectural details in structural ironwork; most of them displayed complete ignorance on the subject, and a few, who hoped to gain their living by building Gothic, were indignant at being asked to use so new-fangled a material as iron. They said they studied nothing since the thirteenth century, though they probably lived in houses of iron stanchions and iron joists were used. A modern student has an instinct that no living building can be made out of ornamental cast-ironwork, and utterly refuses to make any attempt in that direction. This is a pity, for though architects never gain a living by designing ornamental ironwork, it is a fine opportunity for the exercise of invention, as it is untrammelled by precedent, and if the capacities of the material are not limited, there is nothing to prevent beauty being bestowed on it, except want of ability in the designer. I wish also to draw architects' attention to this fact, that nearly all the exhibition buildings, from that of 1851 to that of last year at Chicago, have been of iron, and that most of the buildings for large exhibitions have been, and are, mainly of iron. Here is a considerable field for the exercise of his profession taken from the architect, and handed over to the engineer; all iron and most stone and brick bridges have been so transferred for the simple reason that architects decline to study construction, so that in the eyes of the public, the architect and engineer carry on the same profession, but the engineer is a man of larger mind. All construction that cannot be solved by "the rule of thumb" is persistently neglected, I very much fear that the architect will sink into a tame imitator kept by the engineer to put his crude notions into shape. As it is, when an engineer needs assistance of this sort, he asks to be recommended to a young man who is clever with fingers.

In regard to iron construction, it should not be forgotten that M. Zola said the most swagging buildings of the nineteenth century were the iron central markets of Paris, and compared them favourably with St. Eustache.

Hitherto the general forms of supports, such as piers or columns, have been given them from the ease of building them, *i.e.*, square or oblong in the case of brickwork, or from their security, when built in brickwork the square or oblong stands well, but the circle does not, except the arches are made for it, while in stone a circle is easily dowelled; or from the convenience of their shape in the position they stand in, or stance, in the case of columns; and be it said that the Greeks in their best days never used square plinths to their columns, over which people trip. Occasionally columns have taken their form from caprice, as the knotted Romanesque columns, and the corkscrew columns of Gothic vaults and of the late Renaissance; of the latter, those of Bernini's to the Baldachino of St. Peter's are typical.

In cast-iron it is found that hollow cylinders are stronger than twice as strong as stanchions, whose section is a cross. The proper depth of stone and marble archivolts was gained by experience, and a feature of stepped arches in Romanesque and Gothic, which was originally an economic expedient to save centering, was seized on by the Romanesque and Gothic architects as parts to be named, and has become one of the marked æsthetic features in Gothic.

The groined vault was another economical expedient to save the expense of carrying the walls supporting the main vault to the crown of the cross vaults, and if M. Corroyer's theory be true, the Gothic groin was an expedient to lighten deep domes. The same is true of parts in stone strain, such as stone architraves, lintels, or orders, &c. It was cheaper to keep them solid

than to hollow them out in the middle, even if they could be hollowed out safely, but when the use of cast iron became prevalent, it was found that its power to resist compression was more than six times as great as to resist tension. It was therefore necessary in cross strain to make the bulk of metal in the lower flange six times as great as that in the upper flange. Riga fir crushes with about two and one-third tons on the square inch, and is broken in tension by about one and three quarters tons, but it is only in the case of trusses that it is worth while to consider its respective powers.

The necessity of adopting the cheapest form was made more important when such a costly material as iron was used. We do not yet know whether piers and columns, arches, vaults, and domes may not take new shapes according to the strains they have to bear. We read of some American architects when they have arranged their building for its necessities, getting out their sheets of strains to see the forms and positions of the piers and the shape of the arches.

There is one point that is generally overlooked in speaking of the necessity of studying statics: Vitruvius says (Lib. iii., Cap. 1) "Symmetry arises from proportion, which the Greeks call *analogia*. Proportion is a due adjustment of the size of the different parts to each other, and to the whole; on this proper adjustment symmetry depends. Hence no building can be said to be well-designed which wants symmetry and proportion." Hitherto this proportioning of the parts to the whole has had to be got by arbitrary methods, that is to say we have to study the proportions of the grand antique buildings, which have charmed us to get it, and certain rules have been given us by Vitruvius; but, as our buildings are for such varied uses, and in some respects so different from the antique examples, the precedent of time-honoured proportions has failed us, particularly in those parts which perform some important structural function. Now statics will give us this necessary symmetry, using the word in the Vitruvian sense, and not in the modern one, as far as the structural parts are concerned; and nothing else will do it properly; for, if the buildings to be erected are of a different size from those that have furnished us with the proportions, the parts of a smaller new building will be as much too massive, as those of a larger one will be dangerously slight. Even if we are most concerned about the appearance of our building, we could not make its parts slighter than safety admits, however light we wish our building to look; and if we wish our building to be more massive than necessary, nothing could give us the relative sizes better than to add a uniform percentage to each part.

One of the commonest faults we meet with in modern buildings is a gross disproportion between what is to be carried and the carrying part. To speak of one feature only: we constantly see balconies with cantilevers big enough to carry the house. Balconies about 3 ft. wide, whose floors are apparently composed of 3-in. York landings, may be seen in halls, supported by enormous double curved cantilevers, resembling those that carry the sides of houses in Florence; while the landings would have carried themselves, if properly tailed into the wall. All such monstrosities would disappear if the parts were properly proportioned to the weight they have to carry.

It seems ridiculous to have to insist on the importance of statics when civil architecture is a constructive art, whose productions, buildings, are wanted to stand securely, without extraneous help. The science of statics is defined as "the effects of forces on solid bodies at rest," and a building is always wanted to bear on a building are the gravity of the materials used in its construction; and these materials, when in the form of inclined beams, as in roofs, or of the wedge-shaped pieces in arches, vaults, and domes, tend to overset the parts they abut against. There are also the extraneous loads put into them, which sometimes have a thrust of their own as well. The pressure of the wind, and the vibration caused by it, and the weight of snow, are external forces that act in the same way; and occasionally, though rarely, the mechanical forces of water, ice, and fire.

One must never forget that among the many causes that produce the requisite effects in architectural buildings, those caused by statical considerations are important factors, and in a few cases by far the most important. One can hardly deny that raking shores to a wooden building, when the roof is not tied, form an important feature; and so does the system of stone shoring, which is composed of buttresses

and flying buttresses. The devices resorted to for the abutment of domed structures also give a marked character to such edifices.

Although construction is the master art in architecture, it brings to the architect neither fame nor reputation, not even recognition. The old saw that tells us "to speak well of the bridge that carries us" is universally overlooked.

If there be a successful building, who ever asks who designed it, and who ever mentions the architect?

An ingenious American lady published a book to express her belief that all the most convenient, elegant, and beautiful houses were designed by their owners or occupiers, so very simple does our tremendous art seem to the ignorant; for, as the editor of the *Builder* wittily remarked, "Is not architecture the last stronghold of spontaneous generation?" Yet if the smallest defect be found in the construction of a building, to speak at present of nothing else, the owner will then be awake to the fact that the building was not self-created, and woe betide the architect who has committed so unpardonable a sin. So I must strenuously urge you to learn as much of the science of construction as you can.

I know it is the fashion in writing on the subject to treat it lightly, and say after you have mastered construction, do so and so, but few persons, even of those specially gifted, can completely master it, even if they devote to it their whole lives, and every architectural student is not a Wren. Every architect should, however, know how to calculate the strength of a column, a girder, and a truss, the conditions of stability of a steeple and a wall against the wind, if not of the latter against earth and water, the thrusts of an arch, a vault, and a dome, and the pressure of water in large cisterns, or he may have a most serious disaster. Nor need you be ashamed of some tincture of science, for in the Arabian Nights the architects are always called geometers or mathematicians.

It is because architecture requires such vast and conflicting attainments that it is one of the master arts, and that great architects are much rarer than the black swan. Nothing can be more patriotic than to be the architect of a really great building, even though its dimensions be but small. A whale is not a more perfect or interesting animal than a nightingale or a humming-bird; how much does the monument of Lysikrates heighten our notion of the supremacy of the Greek mind; how much would our admiration of Rome and the Romans be lessened if the Pantheon had not been built; and yet the architects of both these buildings are unknown, or, at the most, known to a few erudite scholars and antiquarians.

The greatness of all nations is built up of the patriotism of the unnumbered and the unnamed. Think of what that skeleton of the sentinel at Pompeii tells of the virtue and patriotism of Rome's meanest citizen. The mere thought of that solitary man braving one of the most terrible catastrophes recorded, and willingly meeting that terrible death at the call of duty, brings tears of tenderness and admiration into our eyes.

Michelangelo says, "Sculpture, painting, architecture, are but subordinate branches of draughtsmanship," but with all deference to this great sculptor, I must, as regards architecture, venture to differ from him, as, in my opinion, it is a transcendental form of construction.

Michelangelo is to be excused for this opinion, for in his day, all that was thought worthy of attention was style and the appearance of buildings—organic advancement could hardly be desired by painters, sculptors, goldsmiths, and antiquaries, who scarcely understood what it meant—though he found to his cost at St. Peter's that something more than draughtsmanship was wanted to make a dome safe. We have Wilars de Honecourt's sketches, which I fear would not have given Michelangelo much pleasure, nor have given him a high opinion of de Honecourt's skill, yet he is believed to have built a cathedral in Hungary, if not in France, and to have made important alterations to churches. It was in the full tide of the thirteenth century when each church was wanted to be in the fashion. We may be sure if Michelangelo could have built a Gothic cathedral, he would have used at least four times as much material in it as Wilars de Honecourt. For permanence, the most skillful of the Gothic architects erred on the side of slowness, particularly in their outside work, as the late flying buttresses have been so worn away by the weather that the whole structure they support would probably have fallen, if not shored while these were renewed. Much of the pierced work of screens and gables, put up for pure ornament, have partly or wholly perished. We may



applaud these Gothic architects' skill, though we must deplore their want of judgment; but it is as likely as not that, like our engineers, they were beset with the difficulty of cost, and thought that "sufficient for the day was the evil thereof." If many of our wrought-iron bridges were not constantly painted and kept in repair, they probably would be there this fallen down.

There is a large chapel at the back of one of the churches in Paris, the ceiling of which seems to consist of flat slabs of stone, apparently supported by pierced stone cantilevers. The appearance of the ceiling is not beautiful, and it produces the worst possible effect in the building, that is, it makes the chapel look unsafe; but in spite of these considerations, one cannot help admiring the architect's profound knowledge of the material he used.

I daresay Paganini produced finer music with all the strings to his fiddle, than when he had cut all but one, but his getting music out of that one, showed his unique knowledge and skill. We should all desire to have such an intimate knowledge of the materials we use, and the skill and daring to use them, displayed by this architect.

We hope, however, we should have self-denial enough to resist the temptation; for, after all, it was but a means of getting the applause of the vulgar. If the vanity and folly of such a proceeding be pardonable, I think we may say that a great artist would have preferred the applause of one judicious critic, to captivating by a mechanical trick all the ignorant in the world.

#### ROYAL INSTITUTE OF BRITISH ARCHITECTS.

THE eighth general meeting of this Institute was held on Monday evening last at No. 9, Conduit-street, Regent-street, Mr. J. Macvicar Anderson, President, in the chair.

The Secretary, Mr. W. H. White, announced that the following gentlemen had been recommended for admission—ten as Fellows, and twenty-eight as Associates:—

*As Fellows*—John Perrins Osborne, Birmingham; Thomas Butterbury, Bedford-row, W.C.; George Hubbard, Finsbury Circus, E.C.; Jethro Anstice Cossins, Birmingham; Frank Barry Peacock, Birmingham; Walter Talbot Brown, Wellingborough; James William Fisher, Wellingborough; David Jenkins, Llandilo, Carmarthenshire; Howard Chatfield Clarke, 63, Bishopsgate-street Within, E.C.; Joseph Morris, Reading. *As Associates*—Charles Kempton, Leicester; Harry Barnes, Sunderland; John Ernest Mowlem, Swanage; Henry Dearden, Batley; Edward Box Wettenhall, Finsbury Park, N.; Ernest Robert Barrow, 76, Mount-street, W.; William Henry Ashford, Penrally; Arthur William Sheppard, Architect's Office, School Board for London; Harold Clapham Lander, 6, John-street, Bedford-row, W.C.; David Forbes Smith, Salisbury; William Tillott Barlow, 23, Finsbury Circus, E.C.; Francis Peter Halsall, Southport; George Ernest Nield, Monument Station Buildings, King William-street, E.C.; John Robert Earnshaw, Manchester; Franklin Kaye Kendal, 1, The Paragon, Blackheath, S.E.; Roger Francis Bacon, Reading; Harry Evan Jones, 9, Moorgate-street, E.C.; John Rennison Little, Bolton; Arthur James Forge, Woodford, Essex; Frank Lishman, 51, Grandison-road, Clapham Common, S.W.; Arthur Hill Morgan, Hoole; Douglas George Salier (Tasmania), 11, Spring Gardens, S.W.; John Lloyd Houston, 13, Fumival's Inn, E.C.; George Harry Maci Trew, Royal Engineer's Office, Woking; John Humphreys Jones, B.A. (Lond.), 9, Moorgate-street, E.C.; John Newnham, 61, Palace Gardens-terrace, Kensington, W.; William John Childs, 7, Cedars Villas, Putney Bridge-road, S.W.; Alfred Kirk Brown, Hull.

The President expressed regret that one of the gentlemen who was appointed an auditor at the last annual meeting had sent in his resignation, being unable to fulfil the duties. He therefore begged to give notice that at the next meeting it would be necessary to appoint an auditor to take Mr. Middleton's place.

#### London Streets and Building Bill.

The President said that all the members were aware that a Bill was being promoted by the London County Council called, "A Bill to Consolidate and Amend the Enactments Relating to Streets and Buildings in London." This Bill contained certain points which they could not as architects approve, and he therefore desired to ask the members, on behalf of the Council, for authority to lodge a petition to the House of Commons

against the principles and details of the Bill. This did not involve an inimical position in any sense to the London County Council; on the contrary, they were now doing what they could to assist the County Council in carrying a really good and beneficial measure. They had suggested that possibly by conference many difficulties which now presented themselves might be removed, and the County Council had accepted the suggestion. The Council, therefore, appointed delegates to meet them in the course of this week, and he trusted the conference would result very beneficially in removing many of those points to which they took exception. There were, however, certain principles in the Bill, to which it was not necessary now to refer, that they could not possibly accept, and it was necessary, if they were to take action at all, to lodge a petition by a certain date. He begged therefore to move:—"That the Council of the Institute be instructed to take the necessary steps to lodge a petition to the House of Commons against 'A Bill to Consolidate and Amend the Enactments relating to Streets and Buildings in London'—the suggested short title of which is 'The London Building Act, 1894'—in order to secure for the Institute a *locus standi* to be heard on the principles and details of the proposed measure before any Select Committee that may be appointed for the purpose."

Mr. Tavenor Perry said he wished to move that a special general meeting should be held to consider the instructions to be given to the delegates before they met the County Council on this very important subject. It was a subject which not only concerned them as architects, and that very seriously, but all their clients, which was much more to their interest; and there were many details in the Bill—limitations of areas and of height and a number of details of that sort—which ought to be discussed by them as practical architects before they instructed any two or three delegates to act on their behalf. If it was necessary to move an amendment, he would propose that a special general meeting or some sort of meeting of the Institute be held at which they could instruct their delegates before meeting the County Council.

Professor Kerr said Mr. Perry's was a separate motion, which the members would probably all agree to in order to give the Institute an opportunity of discussing the matter, just as the Surveyors' Institution were doing.

The President remarked that there was no objection whatever to the Institute discussing the matter; the more it was discussed the better, but it was necessary, in order to give them a *locus standi*, to lodge a petition before a certain date.

Mr. Tavenor Perry said he desired that they, as a body of architects, should have the opportunity of instructing their representatives as to what they were to do.

Mr. William Woodward said he heartily concurred in the proposition made by Mr. Perry. The delegates should have distinct ideas as to the various matters of detail which they would have to consider before the County Council.

Professor Kerr then seconded the motion.

Mr. Payne said the members were asked to assent to a proposition of which they knew nothing. The President had said that there were certain principles in the Bill to which it was not necessary now to refer that they could not possibly accept, and yet the members were asked to give the Council authority to oppose those principles of the Bill which had not been explained.

The original motion was then put and carried with one dissentient.

Mr. Tavenor Perry moved his proposition, which was seconded by Mr. Woodward.

Mr. Octavius Hansard suggested that the word "delegates" should be left out of the motion, because in all probability the delegates would have met the County Council before the meeting was held. He thought they should take the thing broadly and discuss it at a full meeting of the Institute.

Professor Kerr remarked that the Building Committee had stated publicly that the County Council were anxious to obtain the opinions of all and sundry.

Mr. Perry's proposition was then agreed to.

#### The Royal Gold Medal.

The President announced that, at a fully-attended meeting, the Council had resolved to propose, as a fit recipient of the Royal Gold Medal for 1894 the name of one who was in this country—a distinguished painter, an eminent sculptor, a fluent linguist, and a finished orator, but who, in addition—which was, perhaps, of more importance to them—by his literary pro-

ductions, and more particularly his recent Royal Academy addresses, evinced an intellectual grasp and a familiar knowledge of their art, which influenced materially, and could not fail to continue to influence materially, the promotion of architecture. He had, therefore, on behalf of the Council, the greatest possible pleasure in proposing that the name of the President of the Royal Academy of Arts, Sir Frederick Leighton, be submitted to Her Majesty as the Royal Medallist for this year.

#### Mosaics and Fresco.

Papers on the above subject by Messrs. Harrison Townsend, James C. Powell, Salvati, and N. H. J. Westlake were then read. Mr. Townsend observed that English artists and craftsmen were before those of other countries in recognising the conditions of their materials. In stained glass they welcomed the lead lines; wall papers they tried for no fraudulent effect; hung tapestry. Architects were anxious to relieve the grey gloom of this climate by the introduction of colour on the façades and the wall-surfaces of buildings; and they welcomed such craftsmen eager to work out, and apply with conscientious proper principles in such arts as helped them attain that end.

After defining mosaic, mentioning one or two different methods of setting it, and urging that as regards the cement, it should be the artist's endeavour not to treat it as a surface on which the *lessere* were applied, but as a material in which they were placed, he suggested the axioms indicated by a study of what our predecessors have left us to profit by or avoid.

1. The joint was an integral element in the structure of the picture. It should play its part in the design.

2. The surface should not be brought to a dead smooth level. Very beautiful effects were produced by the light as it played on the variously set planes of the *versere*.

3. A minimum, not a maximum, number of tints produced the happiest result.

4. It should always be remembered that mosaic required a simple, bold, uncomplicated treatment. It was to be seen and judged of from a distance.

5. There must be no introduction of artificial effects or atmosphere, nor a striving after realism. The work was decorative rather than imitative, and its figures, trees, and buildings *symbols* only.

As to fresco work, he presumed that he had been asked to say something on the subject because it had fallen to his lot to arrange for series of full-size figure compositions in a church he had lately finished.

Fresco really meant a chemical process successfully carried out. According to the system of Herr Adolf Keim, of Munich—which he was to adopt—an ordinary rough-rendered plaster was laid on the starting-point. On this was laid the first coat of rough plaster ready to receive the painting-ground. This consisted of quartz-sand, marble-dust, and infusorial earth mixed together and added in the proportions of eight parts to one of lime, and laid thinly, say about one-eighth of an inch thick. Throughout, care must be taken that the water was free from lime, to which end only distilled water should be used. The undercoat and the painting-ground, or *intonaco*, being perfectly dry, a solution of hydro-fluosilicic acid was supplied, which prepared the material more readily to absorb two successive coats of dilute silicate of potassium, and the surface was ready for painting. The pigments had to be obtained from Herr Keim, or his London representative, for they were all selected from the point of view of being equally acted on by the alkaline fixing fluid.

James C. Powell, who read the next paper, confined his remarks to the use of glass in the decoration of walls and roofs, and described the different materials used for glass mosaic, and the making of gold for mosaic work. Having described the materials used for the work, he proceeded to consider the different methods of working. In making the first sketch design for the decoration of curved surfaces, such as domes or vaults, it was best to prepare plaster models to scale, from which the exact effect of the work when executed in mosaic could be obtained, which would be impossible in a drawing on the flat, displayed in the usual way. There must be settled that most vital question in connection with mosaic: "Are you going to work in tessera by tessera to the wall itself, or are you going to work it in a studio away from the place it is ultimately to occupy, and in a light different from that it will ultimately receive?" He thought there could be no doubt that the former was the





THE BUILDER, FEBRUARY 17, 1894





INTERIOR OF THE OMEYYAD MOSQUE, DAMASCUS, RECENTLY DESTROYED BY FIRE

FROM A WATER-COLOURED DRAWING BY MR. R. POPE, SENIOR, F.S.A.





in which all the old mosaics were worked, and from the experience he had gained, it was doubtfully the best from every point of view. It was a quicker method, and therefore a cheaper way of working; moreover, what was more important, the mosaicist could see his work grow, and take a more intelligent interest in it. Another great advantage was that the tesserae were once all placed in position by the mosaicist, and gained the inequality of surface given by the pressure of the hand, and the finished work had not the dead-level appearance usually presented by the other methods. After describing some of the work at St. Paul's and elsewhere, he closed with a few suggestions. Mosaic was to flourish and become one of the recognised means of decoration in this country, we must study where to place it to the best advantage on our buildings, and this must not be too near the eye, where fresco and painting would look better. In the old churches of Italy one seldom met it lower than 12 or 14 ft. from the floor. Designs should be broad and simple, and the draperies designed so that they could be worked in lines of tesserae, using the joints of the cement, like the lead-lines in stained glass, so that they would assist the drawing. In coloured grounds one could make them play an important part; by widening the joint and showing more merit they could grey their colour, or by letting the cement show on the surface they got a dark joint and strengthened their colour. In using gold for the grounds of their design they should spread it over all the work, such as patterns, on the tesserae, &c.; in this way they softened the effect the outlines, and prevented the object in their design forming silhouettes on the gold ground. The size and shape of the tesserae were important, and would be controlled by the necessities of the design, and the distance the work was to be seen from the eye.

Mr. G. Salviati described the different kinds of work which had been called mosaic, distinguishing between "inlaid" or marquetrie mosaic, so manufactured that the surface of the work was thoroughly smooth, and monumental or Byzantine mosaic, made by using stone or enamel pieces cut to irregular shapes, which were then put together more or less near to each other, so that between the joints were seen. This work did not look smooth, but rough. This was the sort of mosaic used by the ancients, and the most fitting and at generally adopted for the purpose of architectural decoration. Giving a short sketch of the history of mosaic, and of Dr. Salviati's revival of the manufacture at Venice, he observed that at the old mosaics were worked on the spot they were destined to decorate. The mosaicist, having prepared the surface of the wall and covered it with a layer of cement, produced his subject by putting on the enamel piece by piece: his system of working occupied necessarily a long time, and entailed considerable cost. The method invented by Dr. Salviati was far simpler, and by it they were enabled to produce mosaic work in their establishment in Venice so that it could be conveyed to any place for which it was intended, ready made and quite prepared to be immediately fixed on the cement, whether the position were circular, horizontal, or perpendicular. The subject, after being designed upon paper, was cut into various pieces, which were distributed to different artists, each of whom was employed in covering with mosaic such part of the general subject in which he was specially skilled. These pieces were worked upon paper on the reverse side, and when finished they were packed in cases and sent to the place intended to be decorated. Here the subject was again put together and fixed in the cement on the spot. In this manner mosaic could be produced at convenient cost, and so quickly that this mode of decoration was brought within the reach of all classes. Doubts had been expressed whether mosaic work for exterior decoration would stand a northern climate, especially that of England. He could speak with positive certainty that there were no grounds whatever for apprehending danger. As far as the enamel itself was concerned, if it were well made it was absolutely indestructible.

Mr. N. H. J. Westlake, whose paper was read by Mr. W. D. Caröe, said his intention to have given a short paper on mosaic and fresco, in response to their invitation, had been frustrated by an illness; but he promised their secretary to write a few notes, and he herewith sent them. Before commenting on the best way of recovering these arts practically, he said, we should ask ourselves three plain questions:—

1. If it was possible really to revive mosaic and fresco, to make them living arts, and not archaeological studies?

2. If it was possible, whether they were the most suitable art media for the climate and the modern condition of arts?

3. Or, whether the more modern methods were not the more durable in this country, as far as their durability could be measured?

The first and second questions involved some sentiment in their consideration; the third was a mere question of fact from ascertained data. Concerning his first point, was there sufficient scope and patronage to support them, even if it were possible to revive mosaic or fresco? He had seen effective modern Russian mosaic, and some secular work in Paris, but that on the new façade of the cathedral at Florence was, in his opinion, weak in the extreme—an attempt at showy effect, miscalculated and misplaced. His impression was that mosaic work was alive to a certain extent as an art in Russia, because it was the result of a tradition nearly unbroken, and was in tune with their architecture and rites, as it was with the Christian Greek. Laying aside for the moment the modern methods of making mosaics in most workshops, where they were manipulated upside down, let them look at it from an æsthetic point of view. Mosaic was not the art for churches with elaborated details and modern rites, with figured musical orchestral accompaniments.

A chorus of deep, strong voices in simple tones; an architectural surface almost undisturbed by complicated mouldings, the walls glittering with the facets of the mosaic cubes, forming figures of immense size, of grand and æsthetic aspect, monotonous and solemn, as the architecture and rite—that appeared to him to be the home of mosaic. Was that state of art and ritual possible or probable here *in futuro*? Concerning the second and third points, he had often asserted, and still maintained, that a sound wall would hold a painting as firmly as a mosaic. Then why have recourse to a secondary art—a copy—unfitted for their building, when they could have the artist's own delineation as permanently fixed? Fresco, like mosaic, had had much enterprise, talent, time, and money bestowed on its revival, but he had no doubt that it was less fitting and less durable in this climate than many other forms of mural painting. Nothing would delight him more than to see some good new mosaic or fresco, or a school of new mosaicists and fresco-painters; but an art or style once absolutely dead took a lot of reviving. He thought, therefore, that if mural painting continued it would be in modern media.

In the discussion which followed,

Mr. J. D. Crace, in proposing a vote of thanks to the gentlemen who had contributed the papers, said the important subject of mosaic decoration was one which in itself could occupy more than one night, and it was not unnatural that the fresco portion of the subject had been left in the background. But in reference to what had mainly been the subject of the papers—mosaic decoration as they ordinarily understood it—he was very much charmed to hear Mr. Powell's practical exposition of the working, because Mr. Powell himself was artist enough to have a great appreciation of the methods which really contributed to the ultimate artistic effect. One of those was the setting of the mosaic tesserae themselves—that they should not be on too absolute a plane. Another most important point which had been disregarded by almost everybody who had carried out mosaic on a small scale in this country was that where figures were placed upon a gold ground, the gold tesserae should be repeated in the garments and accessories of the figures, otherwise the figure would unfailingly be a silhouette, as a dark mass against a glaring mass of gold wherever the light fell strongest. That was a point which had been most carefully thought of in the decoration which was now being carried out at St. Paul's, in which he had the pleasure of spending more than an hour that day through the kind invitation of Mr. Richmond. Another point in reference to gold ground mosaics was that their value was very much diminished directly they were on a flat surface. The gold ground mosaic was really only at its full value when it was either on a curved surface or on a surface which at some point or other merged into a curve. St. Mark's at Venice was perhaps the best-known example of this. There was no portion of the field which was covered with mosaic at St. Mark's, but which was gradually led into a curved formation, either at the angles which were rounded off, or merged into a roof which formed

a wagon-headed semi-circular vault. Directly they got a large flat surface of gold ground mosaic, it ran the risk in some lights of looking very dark, although that was very much modified by the proper setting of the mosaic to form an irregular surface. The decorations now going on at St. Paul's were, of course, the most important work of the kind that any of those present were ever likely to see, and any one who had taken some share in it might well be proud. They were being most carefully thought out and most thoroughly studied, both by the artist and by Mr. Powell. If one might criticise it could only be with considerable diffidence and in a most friendly spirit. He thought there was a little tendency in what was done to obliterate some of the features of the architecture, which he did not think should have been quite so much merged in the decoration. In the definition between the mosaic surfaces and the architectural features, such as the rib structures which crossed the vault, and features of that kind, there seemed to him a little want of outline and definition. Another point which struck him, and which he could not help thinking would make itself evident to the artists themselves a little later on, was that the draperies and garments of the figures were over-broken-up; they were not simple enough. On the other hand, the most careful study appeared to have been brought to bear upon the work, and it was one which everyone must watch with the closest interest. He had no doubt that as in every great work there must be much to criticise, so also those who saw it for the first time would be ready to look upon it with a large allowance, recognising the unusual difficulties which must attend a work on such an exceptional scale.

Professor Roberts-Austen said with regard to that most remarkable little church which Mr. Townsend had built at Chilworth, it seemed to him (the speaker) that the chemistry of the process adopted in the fresco preparation was nearly as perfect as possible. Mr. Townsend had very fully described that method, and mentioned that the biting of the ground which received the colour was effected by hydrofluoric acid. That was so in the original description given by Mr. Rivington, but he (the speaker) thought it would probably be found desirable to effect that biting, not by the acid already named, but by oxalic acid, which, although weaker, was sufficiently strong to decompose the marble base, and at the same time to form oxalic lime, which would add to the coherence of the mass. Then there appeared to be no difficulty in applying the colours, which were mostly metallic oxides, and fixing them with silicate of potash. It seemed to him, again, not a little remarkable that, although the first description of this method was given at the Society of Arts in February, 1884, this was (he believed) the first piece of work which had been executed by this very interesting and remarkable method. At any time he would only be too glad to give any architect interested in the process any aid he could in carrying out a work of the kind, because it seemed to him to be so singularly interesting.

Mr. J. M. Brydon, as a member of the Arts Committee, seconded the vote of thanks. He said they were especially indebted to Mr. Townsend for the very able manner in which he had explained the principles which should guide the work. It was very gratifying to find that simplicity, dignity, and quietness was the essence of the whole work. Then it was most instructive to listen to such practical expositions of processes of getting this work out *in situ* as given by Mr. Powell. Again, he felt inclined to revert to the old process of sticking the tesserae in their places on the spot, and not on pieces of paper upside down. All work of this kind must be done on the spot; that was the only way to get the real effect of the work when it was finished. They could not by any possibility get the effect standing in the studio, with the work probably upside down, and then transfer it, say, to the height of the dome of St. Paul's. The real way to do the work was to put the tesserae in the place it was to occupy. He understood Mr. Richmond was adopting that plan in connexion with the work at St. Paul's, which must be to everyone of immense interest. The cartoons which were shown and such of the work as had been seen led one only to this conclusion: that it was one of the greatest experiments in mosaic work done in this country for many years, and everyone who loved St. Paul's hoped it would be an immense success. If one might venture on a criticism it would be on the style of the mosaic.











*Royal Art & Exhibition, 1903*

HOUSE AT KELVINSIDE GLASGOW













SHEFFIELD TOWN HALL (SOUTH-WEST ANGLE) —MR E W MOUNTFORD, F.R.I.B.A., ARCHITECT



LOCAL OFFICES AND FIRE STATION, HARROW—MR C FORSTER HAYWARD, FRIBA, ARCHITECT

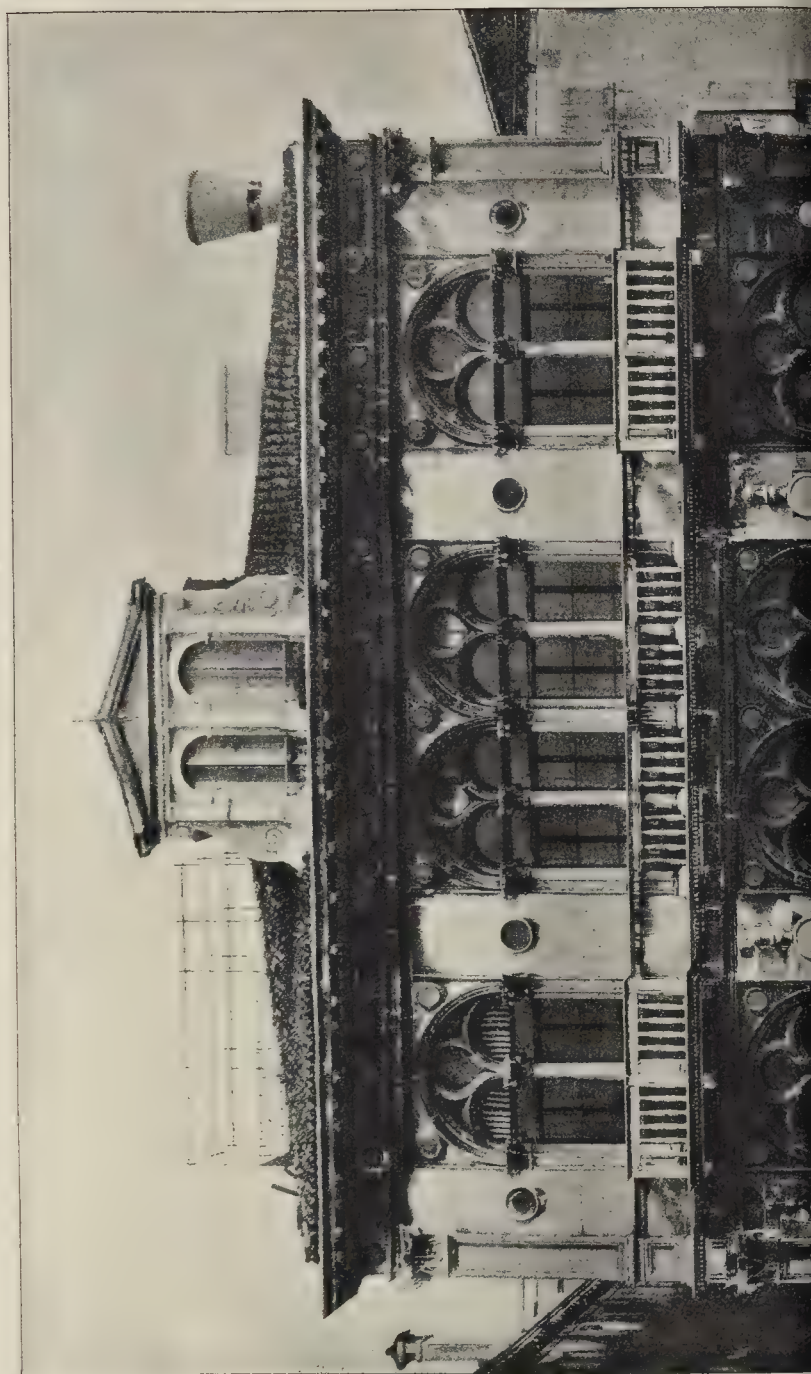








THE BUILDER, FEBRUARY 17, 1894.





THE SPINELLI PALACE, VENICE

*(Published as an Illustration to Professor Atchison's Royal Academy Lectures.)*





ged by fire, that the remainder was covered stucco. The dome and gallery beneath painted in gaudy colours in the last century. R. PHENÉ SPIERS.

#### THE SPINELLI PALACE, VENICE.

THE façade of this palace is published here at request of Professor Aitchison, as an important remedy, referred to in his second Royal Academy lecture (published in the *Builder* of last week), of the architectural advantage of designing rooms in relation to the space they have to fill, so as to afford some external indication of the nature of the rooms with which they are connected, and assist the exterior architectural expression of the building.

#### HOUSE AT KELVINSIDE, GLASGOW.

THIS house has been recently erected in a suburban suburb of Glasgow. The chief feature is a hall about 60 ft. long, 20 ft. wide, and 12 ft. high to the apex of the roof. One end of the hall is screened off by pillars and arches, forms the main staircase. At one side in the hall there is a large and fine organ. Another end recess contains the hall chimney-piece.

The arrangement of rooms on the two principal floors is shown by the plans. On the attic floor there is a range of nurseries towards the front and servants' rooms to the back. The basement contains heating chamber, engine-room, &c.

The walls of the house are of stone from the neighbourhood of Alloa, of a fine warm greyish tone, the window dressings and corners being of dark red stone. The framed timber work is all in white with red bricks, the roof being covered with green slates. The framed timber of the roof is filled with yellow-toned cement.

The architect is Mr. T. L. Watson, and the drawing from which our illustration is taken exhibited at the Royal Academy last year.

#### STEELEFIELD MUNICIPAL BUILDINGS: SOUTH-WEST ANGLE.

THIS drawing, which was exhibited at the Royal Academy of last year, shows the right-hand end of the principal front of the building. The small window and the large windows on the same level are the end and side windows of the Mayor's room. Beyond, to the left of the drawing, are the first two of the range of windows of the main gallery.

The ground floor windows are those of offices (divorcer, accountant, &c.); the gateway gives access to external stairs leading to some of the principal offices. The plans of the building were published in our issue of June 28, 1890. The architect is Mr. E. W. Mountford.

#### LOCAL BOARD OFFICES AND FIRE STATION, HARROW-ON-THE-HILL.

THE Harrow Local Board Offices are connected with the fire station, the former on the upper floor, the latter on the ground level, below which are store-rooms and residence for the keeper, who is always ready to answer an alarm ring the fire-bell, which, as will be seen, is a conspicuous feature in the design.

There is a "look-out" on the roof which has a very extensive range of view, and this is used as a meteorological station.

Although the situation is one of the most prominent and central in Harrow, no attempt has been made to add expensive features to the design, which is intended to be simple and unpretentious, while showing distinctly the object for which it is erected.

The Local Board is to be congratulated on the choice of such an excellent site, and on their wise spirit and economy in what they have taken upon it, for the cost of these buildings complete was only about 2,000*l.* The architect Mr. Charles Forster Ifayward, of London. The drawing of the building was exhibited at the Royal Academy last year.

#### COMPETITIONS.

SCHOOL, ROYTON, LANCASHIRE.—The Royton Local Board invited four architects to compete for designs of a proposed school. After consideration the plans sent in, Messrs. Butterworth & Dean and Mr. Wolstencroft were invited to a competition (both to be remunerated), with the result that the plans sent in by Mr. Wolstencroft were accepted.

#### ARCHITECTURAL SOCIETIES.

##### EDINBURGH ARCHITECTURAL ASSOCIATION.

—The monthly meeting of the Edinburgh Architectural Association was held on the 7th inst. in the Royal Institution, Princes-street. Mr. W. Robertson, President, occupied the chair. Mr. J. M. Gray, F.S.A. Scot., Curator of the Scottish National Portrait Gallery, read a paper on "Engraving on Metal: its Technical Processes and Artistic Results." The lecturer considered in detail the various processes of engraving on metal, and the artistic results which they yielded. The method of line engraving Mr. Gray styled as *par excellence* the classic mode of engraving, and stated that its highest function lay in translating into black and white, by the most careful, finished, and accomplished method, the great masterpieces of the painter's art. It was noticed that the early line engravers were original artists, who reproduced their own designs, and special reference was made to the plates engraved by Martin Schongauer, Van Mecken, Albert Durer, and Lucas Van Leyden. In Marc Antonio they had, however, an early engraver who devoted himself to reproducing another artist's work—the designs, namely, of Raphael. The line engravers of France and Holland of the seventeenth and eighteenth centuries, and the great school of English line engravers, who reproduced the landscapes of Turner, were dealt with, and the technical processes of etching were explained. Etching, he said, was pre-eminently a process for sketches, in which the line should be used with the finest selection, and be as expressive as possible. Rembrandt was instanced as the great master-etcher, and reference was made to the modern revival of etching as an artistic process in France and England. Mezzo-tint was the last method with which the lecturer dealt, a process fitted for realising perfect tonality, and, as it worked by spaces, not lines, for rendering the breadth of effect that is attained by the painter's brush. Reference was made to the magnificent renderings of Reynolds' portraits by this process, and to its use by Turner and Constable in reproducing their landscapes. A vote of thanks was accorded to Mr. Gray at the close of the lecture.

SHEFFIELD SOCIETY OF ARCHITECTS AND SURVEYORS.—The monthly meeting of this Society was held on Tuesday evening last at the Technical School, where the Principal of the School, Prof. Ripper, M.I.M.E., delivered an address on "The Testing of Materials." The Professor first conducted the members of the Society through the school and explained the working of the various departments. An adjournment was then made to the testing-room, where the Professor explained the construction and method of using the testing machine, and afterwards conducted a series of experiments. These were of a practical character, and included tests for cast-iron by tension, crushing and breaking a transverse test-bar. Mild steel and wrought-iron were also subjected to the tensile test. Samples of red lead were broken transversely and crushed. The crushing-test was also applied to a sample of the ordinary red brick used in the neighbourhood. Lists of the experiments to be shown were distributed to the members; these gave the usual breaking weights of the various materials and spaces in which to record the results of the experiments witnessed. At the close of his address, the Professor drew attention to the facilities afforded by the school for the pursuit of many branches of study necessary to the young architect, and expressed his willingness to meet the requirements of the architectural students by arranging for other classes if this were thought desirable by the Society.

#### ENGINEERING SOCIETIES.

THE JUNIOR ENGINEERING SOCIETY.—The last visit of this Society was to the Battersea Polytechnic Institute, on the invitation of the Principal, Mr. S. H. Wells, Wh. Sc., by whom, with Mr. W. G. Walker, a large party of members were shown over.—At the meeting of the Society held on the 9th inst., a paper was read by Mr. A. H. Dykes, A.E.E., on "The Construction and Working of Electro Motors." The author commenced by stating that, whenever a current of electricity is passed through a conductor lying in a field of magnetic force, as between the poles of an electro-magnet, the conductor has a tendency to move across the field. If the force is sufficient to overcome the opposing forces and move the conductor across the field, an electro motive force is set up in it, and the potential difference required to send the current through it is increased by the amount of

this back E M F, or  $P D = e + c r$  where  $r$  is the resistance of the conductor. The work done is  $P D \times C = e c + c^2 r$ ,  $e c$  being the equivalent of the mechanical work done in moving the conductor, and  $c^2 r$  the power wasted in heat. It was then shown how this simple motion of translation can be converted into a motion of rotation, and the function of the commutator was explained. The torque exerted by a motor was seen to be dependant on the number of conductors on the armature, on the current passing through it, and on the strength of field produced by the field magnets. The various ways of winding the electro-magnets were dealt with and the relative advantages of shunt and series motors for different requirements considered, examples being taken from tests of the City and South London Railway motors. The paper concluded with a description of the faults most likely to occur—"earth" and "shorts" and the best means of determining and repairing them. Specimens of parts of electro-motors were exhibited.

SOCIETY OF ENGINEERS.—The first ordinary meeting of the Society of Engineers for the present year was held on the 12th inst., at the Town Hall, Westminster. Mr. W. A. McIntosh Valon, J.P., the President for 1893, first occupied the chair, and presented the premiums awarded for papers read during his year of office, viz.:—The President's Gold Medal to Professor V. B. Lewes, for his paper on "Gas Substitutes." The "Bessemer Premium" to Mr. R. Nelson Boyd, for his paper on "Collieries and Colliery Engineering." A "Society's Premium" to Mr. E. G. Mawbey, for his paper on "the Leicester Main Drainage, &c.," and "Society's Premium" to Mr. Robert Carey for his paper on "Hydraulic Lifts." Mr. Valon introduced the President for the present year, Mr. George A. Goodwin, to the meeting, and retired from the chair, receiving a unanimous vote of thanks for his services during the past year. The President having taken the chair, prefaced his address by referring to the satisfactory progress and condition of the Society, stating that its position was better than it had ever been, and that the *raison d'être* of its existence was a worthy and a much appreciated one, viz., to hold out a helping hand to the younger members of the profession, to offer them special inducements in taking part in the discussions on the papers read at the monthly meetings, and the making of the annual summer visits to works of engineering interest, under construction or completed, where again useful information was obtained, and of special value to the younger members. After referring to last year's visits and the work of the Society, he commenced his address proper, which dealt with the present position and practice of mechanical engineering. In conclusion, he gave a few words of advice to the younger members who had elected to follow the noble profession of an engineer, recommending a sound practical training by day with theoretical study in evenings; to follow up some speciality to the hilt, but at the same time to obtain and maintain a good general knowledge of other branches, and stated in the words of Francis Bacon—"I hold every man a debtor to his profession; from the which as men, of course, do seek to receive countenance and profit, so ought they of duty to endeavour themselves by way of amends to be a help and ornament thereunto."

ROMAN ROCHESTER.—During the excavations carried out in connexion with the rebuilding of Sir Joseph Williamson's Mathematical School at Rochester, an interesting archaeological discovery was made. It was found that the Saxon work of the old city wall and Eastgate Tower rested on Roman foundations, and during the progress of the operations Roman remains were opened up to a considerable extent. The Rochester Town Council have now taken steps to preserve for public inspection these interesting works of the Roman and Saxon periods of the history of their ancient city. A strong desire was manifested to continue the investigations and to further open up Roman Rochester, but the Corporation came to the conclusion that they could not fairly and legitimately devote the money of the ratepayers to this purpose. Therefore, whilst they are doing all that is necessary to maintain access to the Eastgate Tower and the other ancient relics, the Corporation have decided to leave any future researches to antiquarian and kindred societies.

A NEW WRAPPER.—The "Patent Strip Wrapper Syndicate" have sent us a wrapper for cylindrical packets, which has a double row of parallel punctures half-an-inch apart, by means of which the slip of paper between can be torn off and the wrapper unfastened in a moment, without any of the delay and occasional danger of injuring the enclosure by cutting at the wrapper to get it off. The patent is on the same principle as the punctured divisions for postage stamps, and is likely to be very useful.



## THE LONDON COUNTY COUNCIL.

The usual weekly meeting of the London County Council was held on Tuesday in the County Hall, Spring Gardens, Mr. John Hutton, the Chairman, presiding.

**Loan for Electric Lighting.**—The Finance Committee recommended that the application of the Vestry of St. Pancras for a loan of 30,000*l.* (inclusive of the sum of 15,400*l.* previously sanctioned) towards defraying the cost of electric lighting works in the parish, be granted to the extent of 29,700*l.*, on condition that it was repaid within a period of twenty-five years.

Mr. Charles Harrison (vice-chairman) moved—“That the recommendation be referred back to the Committee, with an instruction that as the loan will be expended, not for renewals, but for initial cost in establishing electric lighting works which are income-producing and remunerative, it is advisable that the loan should be made for the full term sanctioned by Section 7 (iv.) of the Money Act, 1892, for electric lighting purposes, namely, forty-two years.”

Mr. McCall seconded the amendment, which, after a long discussion, was, on a division, defeated by sixty-one votes against thirty-six.

Dr. Collins then moved, and Mr. Benn, M.P., seconded, an amendment to the effect that “thirty years” be substituted for “twenty-five years” in the recommendation.

On a division the amendment was rejected by forty-nine votes against forty-four. The recommendation of the Committee was then adopted.

**West London Tramway Bill.**—A report was brought up of the Highways Committee, which stated that the West London Tramways Bill proposed to authorise the construction of tramways from the existing line (of the West Metropolitan Tramways Company) in Uxbridge-road, along Askew-road, Paddenswick-road, and Church-ham, and portions of the Broadway and the Hammersmith-road, to the building known as Olympia. Several other short connecting lines were also projected. Some of the roads through which it was proposed to lay those tramways were narrow. In six places there would on both sides of the street be less than the statutory width of 9 ft. 6 in. between the rail and the kerb, and in one place that space would be on one side only. They were of opinion that, in the circumstances, the proposals in the Bill were not such as the Council should approve, and they accordingly recommended:—“That the consent of the Council be not given to the introduction into Parliament of the West London Tramways Bill.” This was agreed to.

**Expenses Incurred by a District Surveyor.**—The Finance Committee brought up a report containing the following paragraph:—

“On November 21, 1893, the Council, on the recommendation of the Building Act Committee, directed that the sum of 42*l.* 8*s.* 1*d.* be paid to Mr. Crow, District Surveyor for Whitechapel. The amount named is the balance of the costs incurred by Mr. Crow in respect of proceedings taken against builders (twenty-eight summonses being taken out) for using bad mortar in the erection of some warehouses in Sherry-yard and Haydon Hill, and a public-house in Whitechapel High-street. The total sum expended is 265*l.* 4*s.* 11*d.*, and the amount recovered from the defendants 222*l.* 16*s.*, leaving a difference of 42*l.* 8*s.* 11*d.*, which arises not from failing to recover any part for which the defendants were liable, but from Mr. Crow's solicitor and client costs exceeding the amount of the fines and costs allowed by the magistrate, and it is in consequence thereof that Mr. Crow asks the Council to pay this deficiency. We have had to consider whether there is any legal liability on the Council to pay this amount, and, the solicitor having reported to us that there is no such liability, we are under the necessity of reporting that fact, with an intimation that, as at present advised, we are not prepared to recommend the payment of the amount.”

Mr. J. W. Benn, M.P., moved that the paragraph should not be received, on the ground that the money was clearly due to the Surveyor, and should, therefore, be paid.

Mr. Strong seconded, and, after some discussion, the amendment was agreed to unanimously.

**Electric Lighting of the Victoria Embankment.**—The Highways Committee reported that—

“The drawings for the installation works for the lighting of the Victoria Embankment and Gardens and Westminster and Waterloo Bridges, as authorised by the Act of last Session, are in course of preparation, and will shortly be so far completed that the specification and estimates may be prepared. In the meantime it appears to us that the work of laying the necessary conduits and forming the refuges round the lamp columns can be proceeded with at once. The Chief Engineer's estimate of the cost of this preliminary work is 2,000*l.*; and we recommend—

“That, subject to an estimate being submitted to the Council by the Finance Committee, as required by the statute, the work of laying the necessary conduits and the forming of the refuges round the lamp-columns in connexion with the electric-light installation for the Victoria Embankment, &c., be carried out by the Council without the intervention of a contractor; and that the plans, specification, and estimate be referred to the Works Committee for that purpose.”

Mr. Lloyd moved to refer the recommendation back, on the ground that the high lamp-posts which it was proposed to place in the middle of the roadway would greatly disfigure the embankment.

This view was taken by several other members of the Council, and the amendment was adopted on a show of hands by 33 votes against 20.

**Chelsea Embankment Extension.**—The report of the Improvements Committee contained the following paragraph in reference to Chelsea Embankment extension:—

“The Council on July 28, 1890, decided to apply to Parliament for power to extend the Chelsea Embankment westward, subject to a contribution by the Vestry of Chelsea of one half of the net cost, which, at that time was estimated at 62,000*l.* As, however, the Vestry declined to contribute more than 8,000*l.*, the application to Parliament was not proceeded with. Since that time we have received several applications from the Vestry for a reconsideration of the suggested improvement. After considerable negotiation the Vestry offered to contribute 8,000*l.* and to do the necessary filling-up work connected with the formation of the new embankment. We informed the Vestry that we were prepared to recommend the Council to take the necessary steps for carrying out the improvement, including the necessary filling-up, if the Vestry would contribute one-third of the net cost, which at the present time is estimated at 64,000*l.* We have now received a letter from the Vestry stating that, in view of the proposed alteration in the source of taxation for London improvements, it has decided to withdraw its offer to contribute towards the cost. In these circumstances we have resolved to take no further action in the matter.”

**Protection from Fire in London.**—The Fire Brigade Committee presented a report as to the additional protection from fire in London, which, as it involved the expenditure of more than 5,000*l.*, stood over until next week. It recommended the establishment of a river station at Battersea, fifteen new fire stations, and a number of new sub-stations and fire-escape stations, at an estimated cost of 92,570*l.* on capital account and 24,300*l.* for maintenance. Allowing for redemption of capital, &c., the total increased annual cost of the Brigade would be about 29,000*l.*, or something less than a farthing in the pound.

The Council then adjourned.

## THE LONDON STREETS AND BUILDINGS BILL, 1894.

On the 5th inst. Mr. Henry Blackburn read a paper on “The London Streets and Buildings Bill, 1894,” at a meeting of the Surveyors' Institution. The author said that he proposed to refer to a few of the more salient points of the proposed Act, and to divide the subject into four heads:—1. A consideration of the lines legislation should follow. 2. The new points which have of late years arisen for legislation. 3. Alterations that were needed and have been made. 4. Alterations that appear weak, or, in some cases, too severely stringent, and in others confiscatory, and which it is to be hoped will be revised before the Bill passes into law. After paying a tribute to the useful service the Act of 1855 had rendered, and referring to the confusion that had arisen from the later Amendment Acts, the author, in considering the first head of his paper, said the first and in one way the most important proposal—for it affected all the rest—was the proposed establishment of a tribunal of appeal. This would probably meet with general approval, as calculated to inspire public confidence, and as tempering the vast discretionary powers vested in the Council. . . . The proposed tribunal was to be composed of five members, appointed respectively by the Government, the County Council, the Institution of Civil Engineers, the Royal Institute of British Architects, and the Surveyors' Institution. None of these five might be a member or officer of the Council. As a tribunal of appeal on the many questions before the Council, it was, with perhaps one exception, all that could be desired. That one exception was the assessment of compensation for land and buildings taken and for trade affected, and if the Bill passed there would be many and important decisions of that kind to be settled. . . . There was only the representative of that Institution

who would in any direct way be considered expert here. . . . Under the third head of his paper the author said that Section 68 rightly dealt with railway arches where used for habitable rooms. There could be no doubt that the exemption of railways from the Act of 1855 had been abused by the Companies. . . . It was to be wished that the Council had sought power in this Bill over staircases and gangways so that catastrophes, as that on a Bank-holiday at Hampstead some two years back, might be avoided. Section 75 was of importance, as reversed, and he thought wisely, the existing law that independent of a right of easement or prescription the adjoining owner has no claim for support for buildings. It was easy to see how this law had arisen, but it seemed that the time had come to reverse it, and few could be so aggrieved as it was surely fair that the holding urban land should meet the responsibility that seemed rightly attached to such property. . . . Section 176 required all advertising tables to be of fire-resisting materials, and so placed as not to cover more than a quarter of the area of any window. This, besides being a precaution against the spread of fire, would discourage the making of the front into one gigantic advertisement hoarding. . . . Section 43 required that floor joists, trimmers, &c., should be of a sufficient scantling, and they were put at figures that showed almost content even a speculative builder. . . . One was at a loss to understand why these should be given, and the girders and columns that the whole buildings be omitted. Would it not have been well to have given, say, a ruling proportion for depth in centre relative to the span; a ruling for tensile and compressive strains per inch super which the flanges were to be calculated, both for iron and steel, for those carrying walls and floors, those carrying floors? It was in these points that builders mostly transgressed, yet the District Surveyors were still left without definite guiding directions. In dealing with the fourth head of his subject, the author said Section 7 proposed to enact that if the Council deemed it expedient, certain roads must, if made at a cost of more than 40*l.* per foot, be made of such greater width than 40 ft. as they in the public interests may require; but they cannot require a greater width than 60 ft. For the development of an estate, and for the sites immediately abutting upon the said roads, and for the neighbouring roads of the estate of an owner proposing to form the road, 40 ft. might be an ample width. Yet in the public interest the road might be required of greater width, and this public improvement was to be at the cost of the private owner, both as regards land and cost of formation. Nothing was said of compensation either in this part of the Bill or in the powers of the Tribunal of Appeal. Again, why should the width required be limited to 60 ft? Although that made a good wide road, there were times when a still greater width was necessary for imposing thoroughfare. . . . But even more confiscatory was Section 13, which proposed to enact that “in case of any building which shall in any part thereof project beyond the general line of building in a street or beyond the front of a building wall or railing on either side thereof shall at any time be taken down to an extent exceeding half of such building (such half to be measured in cubic feet), or shall be destroyed by fire or other casualty, or demolished, pulled down or removed from any other cause to the extent aforesaid, it shall be lawful for the Council to require the same building or any new building erected on the site or any part of the site thereof to be set back to such a line and in such a manner as the Council shall direct.” “The Council shall make compensation to the owner of such building for any damage and expenses which he may sustain and incur thereby.” So far good; but was that broad and clear enough to include the various losses to the owner? It might be that the site taken might be so reduced as to be no longer large enough for rebuilding at all, and might leave but a small and odd-shaped piece of practically useless land; so that the business good-will, and perhaps licence might be swept away too. These were not mentioned, though the words “compensation” and “expenses” would, perhaps, cover them; but they might with advantage, be clearly and definitely expressed, especially so when we find that the next paragraph runs, “Provided that the tribunal assessing the amount of such compensation shall take into consideration any increased value or improvement which may accrue to the building or other property of the same owner by reason of the setting back of the building.” A possible contingency of betterment that might cheapen the property was set out at length, but the various



claims of the owner were shadowed forth in the words "compensation" and "expenses." That evidently needed re-drafting. Was not the whole of this latter portion of Part I. of the Bill (from Sections 7 to 14 inclusively) drawn with such evident disregard of private rights as to justify the adjective "confiscatory"? Section 30 required that every new domestic building—and this term included shop property—shall have in the rear a roof, wide open space throughout its entire width; this may only contain above the level of the ground a water-closet or earth-closet, and ash-house, not exceeding 9 ft. high. This prevented carrying shops throughout the entire ground-floor area, as was so often done, and to which he for one saw no objection. As they had to be top-lit, they were usually covered with lead or zinc flats, and could be easily traversed in the event of fire, and provided lean-to skylights against the back main wall of house did not extend the whole length, they often formed in such cases an excellent means of escape at back first-floor level. The Metropolis Management and Building Act of 1882 now in force did not forbid such continuation of shops over the whole of the back area, as the space there required to be "above the level of the ceiling of the ground-floor story," but there was no such saving clause in the proposed Bill. Might it not well be inserted?

Section 31 provided that a domestic building, fronting a street less than 40 ft. wide, and erected upon a site which at the commencement of this Act or within seven years previously, has been occupied by a domestic building shall not be subject to the provisions of the Act prohibiting the erection at less than the prescribed distance, provided a clear space, which may be enclosed with a wall not over 7 ft. high, be left between such external wall and the centre of the roadway of not less than 20 ft., or if the building exceeded 40 ft. not less than half the height of such building; or put briefly, the building was to be set back, but the space so obtained by setting back might be retained by the owner as a forecourt. But mark, no compensation for depreciation was so much as suggested. The public improvement was to be made at the expense of the unlucky owner. The effect would be to leave a number of forecourts or waste places of little advantage to the public (except for additional light and air) and certainly none to the owners, while the loss would in many cases be very great, as the site, especially when the regulations as to open, unbuild-up spaces in the rear were considered, might not allow of buildings being other than very shallow, and this, not in new streets only, but in perhaps crowded thoroughfares that have long existed. Again, having once got all the buildings set back free from expense or compensation, at how much less cost could these forecourts afterwards be taken into the public path, and the roadway widened.

Section 38 proposed to enact that no building shall be of greater height than the distance across the road to the building opposite. Some, whilst agreeing with this as a general rule, would yet wish an exception made in the case of corner buildings, on the ground that these afforded opportunity for more effective architectural treatment, and that as the sites were more costly, it was but reasonable that more should be expended on the buildings. There was much in this view, especially as light and air were gained here by the side road joining. It might, however, be urged on the other side, that if it was a site worthy of a specially effective building, reference could be made to the Council, or finally to the Tribunal of Appeal, and it was not worth that trouble and expense it could not be worth seriously considering. Still it might be well to have a saving clause permitting, say, 30 ft. from the angle each way being carried up an additional 12 ft. or so, and the roof of same at an angle not exceeding 75 deg. In the schedule of thicknesses of walls there was an alteration that would largely affect small suburban house property. At present walls not exceeding 5 ft. 6 in. in height and 30 ft. in length may be one brick thick. This would be so still if there were not the bottom one must be a brick and a half thick. He maintained that if an alteration was made, it should be just the other way about, so that a wall the said height was more tied by the doors where there were three stories than where there were but two. Surely the weight goes for nothing, for 9 in. in this class of work was strong enough in either case. The unsuitability of 9 in. brick was, in such cases more in its failing to resist damp. The strength in the tying in by joists was certainly not durable, and he would have gladly welcomed a section, banishing wall plates and ends of joists from external as from party walls. The

disadvantages would be the slightly greater cost, and a great loss in the tying together of walls, but walls should not be tied in by floors, or together by plates, but by party- and cross-walls.

Section 55 required that every habitable room should be built in future 8 ft. 6 in. high instead of 7 ft., as required by the present Act; and that half the area of each room in the roof of any building should be at least 8 ft. 6 in. high instead of 7 ft. as at present; also that the superficial area of windows should be one-tenth the floor area of the room, of which one-half must be made to open; and for rooms in a roof one-twelfth area of room should be the window-area and half opening, or it might be lighted by a lantern light, of which a portion equal to at least one-twentieth of the floor area can be open. This was all as it should be for good and healthy rooms. Yet, was not the standard pitched too high? It would, perhaps, have been well to have raised the minimum height of rooms to 8 ft., and for attics half the area to 7 ft. 6 in. high; also the opening areas as proposed, but the lighting areas might have been less. It was only for bedrooms such legislation was required, and a full light was not there as necessary as in living rooms. This cost of houses rented from 28s. to 40s. per annum, about 10 or 12 per cent., and houses of this size were those in which perhaps half of the population of the Metropolis dwelt; this must in its turn, increase the rents, and make families endeavour to do with fewer rooms, thus causing social evils.

But if the first three paragraphs of this section (55) were open to criticism, what should be said of Sub-section D, which would enact that, "Every habitable room, the windows of which do not directly overlook a street of at least 30 ft. in width, shall be so constructed as to be lighted by a window, or windows, or by a skylight, whereof a total superficies clear of the sash frames, equal to not less than one-twelfth of the floor area of the room, shall be above an imaginary line drawn downwards at an angle of 45° with the horizon from the top of the parapet, or from the eaves of any building directly opposite to such window."

This would often prevent dining and such rooms, that were chiefly used in the evening, clerks' offices, and counting-houses, being economically planned; whilst it would prevent any bedrooms or reception-rooms in residential flats and model-lodging-houses on any but the top floor being lighted from areas; and when it was considered that such would now all be bottom ventilated, and that in flats many rooms were only occupied for some two months in the year, by those spending only the season in town, it would be seen that this proposal was somewhat fussy.

It had been stated that the County Council had declared that, save for verbal alterations, the Act must stand or fall as it is. If this meant that such verbal alterations were to be but casual and slight, it was to be hoped the Bill would be thrown out. But if the needed alterations could be so made, so as to render justice to those at whose expense contemplated improvements were to be effected, and to effect the rectification of some small points, such as those he had directed attention to, he, for one, should wish well to the Bill.

#### CLERKS OF WORKS' ASSOCIATION OF GREAT BRITAIN:

##### ANNUAL DINNER.

The eleventh annual dinner of this Association was held on Monday evening at the Holborn Restaurant, where a large company sat down, under the presidency of Mr. James Brooks, Vice-President, F.R.I.B.A.; the vice-chair being occupied by Mr. J. Aitchison. The loyal and patriotic toasts were proposed from the chair, that of the "Army, Navy, and Reserve Forces" being responded to by the secretary, Mr. Dashwood. In proposing the toast of "The Architects and Surveyors," Mr. J. Brady, congratulated the Association on having had so long a succession of gentlemen eminent in the architectural profession to preside at their annual banquets, the list including Professors Rogers Smith, Banister Fletcher, and Mr. Chatfield Clarke, Mr. J. Macvicar Anderson, Mr. Ch. Barry, Mr. Webb, Mr. Blashill, and concluding with their chairman that night, Mr. Brooks. He thought the architect should always endeavour to make friends of their clerks, and in order to gain their confidence and secure from them good work, they should always deal directly with their clerks of works. The toast having been duly honoured, Mr. C. J. Jones briefly responded for the architects, and Mr. John Leaming responded for the surveyors.

Mr. Leaming said the quantity surveyor had to work very hard. There were no eight-hour days for him, but rather days of eighteen hours' labour. He was expected to know everything, and the duty he had to perform was generally not only imperfectly appreciated but badly paid.

The Chairman next proposed "The Clerks of Works' Association," calling upon Mr. Aitchison, the President, to reply, after the toast had been duly honoured.

Mr. Aitchison referred to the circumstances which led to the formation of clerks of works' associations. At one time architects had to advertise and to incur a considerable amount of expense before they could find the men they required to carry out their ideas. Now, that Association, with rules so drawn up that none but those qualified should be admitted as members, had been formed, the proper class of men were easily found. Black sheep were to be found in all other flocks, but there were none in theirs. The duties of a clerk of works were very different thirty or forty years ago from those of to-day. New questions were arising every week, and specialists were being constantly multiplied in matters connected with building construction. Heating, electricity, and sanitation were only a few of the subjects the clerk of works was expected to read up and study. The rates of remuneration had not increased in the same proportion, in proof of which fact he adduced an advertisement which had recently appeared demanding a clerk of works from the country possessed of every professional accomplishment, of good temper, and with a character which, like Caesar's wife, must be above suspicion. For this paragon the salary offered was 50s. per week.

Mr. Wilkinson proposed "The Visitors," coupling with the toast the name of Mr. Stanton W. Preston, clerk to the Carpenters' Company.

The toast having been received, Mr. Stanton W. Preston said that although the Clerks of Works' Association showed that it appreciated the privilege of using the great hall of the Carpenters' Company, it was none the less the fact that the Carpenters' Company was under equal obligations to the Clerks of Works' Association for the advice given by them in the examinations. The importance of these examinations was growing year by year, and the certificates were looked upon as every year more and more valuable.

"The Worshipful Company of Carpenters" was proposed by Mr. W. Baker, and replied to by Professor Banister Fletcher, who, after referring to the good work done by the old Corporations in building up gradually during the last 700 years the greatest city in the world, said the Carpenters' Company did not rest on the laurels of the past. For the past seven years they had supported the technical classes at Kings' College, and every year there was some fresh work demanding the support of the Company. Since last year they had started a great work at Great Titchfield-street. The old city companies would sometimes think for years over a project before acting, but when they acted they were seldom obliged to ship the rudder. They had established joinery classes and carpentry classes containing respectively twenty-two and twenty-four pupils, a like class for tiling and brick-laying, and some forty students in other branches of manual education.

Mr. S. E. Wallis proposed a toast to the Hon. Treasurer, Mr. J. Oldrid Scott, which was responded to by Mr. P. Shaw. The last toasts on the list were "The Press" and "The Chairman." In proposing the former toast, Mr. T. Simpson said he could not sit down without referring to their very good friend, the late sub-editor of the *Builder* (Mr. L. J. Dessurrie), whose loss they all deplored.

#### CENTRAL ASSOCIATION OF MASTER BUILDERS OF LONDON.

The twenty-second annual general meeting of this Association was held at the offices, 31 and 32, Bedford-street, Strand, on the 9th inst., Mr. Frank May, J.P., President of the Association, in the chair. The Secretary, Mr. Richard S. Henshaw, read the audited accounts and the report. The Council expressed their regret at the death of their late Secretary, Mr. E. S. Henshaw, who for so many years had faithfully served the Association and held the esteem of all. The Council were glad to be able to congratulate the Members of the Association upon the support it had met with from the influential portion of the trade during the last twelve months, there being few builders of consequence who were not members. The Association, whilst guarding the interest of the trade, had endeavoured in the many negotiations and conferences with the delegates from the various



trade societies, to act fairly towards all parties. In consequence of a paragraph in the report of last year, in which reference was made to the payment of workmen leaving work of their own accord, which was somewhat ambiguous, the Council, at the request of the Secretary of one of the Trade Societies, called a meeting of one representative of each trade, which was attended by all except the carpenters and joiners, when the following rule was signed:

*Rule 51.*—Any workman desiring to leave work during the week shall be entitled to receive his money at 5 p.m., as provided for by Rules 5 and 7, subject to his having given the foreman notice before 12 noon. Notwithstanding the above arrangement, in the event of more than 10 per cent. of the workmen of each trade employed at the shop or job giving notice to leave during the week, they shall not be entitled to receive their money until the usual time on the following Saturday.

The Council regretted to report that the reduction of working hours, together with an increase of wages, had not had the anticipated effect of promoting greater activity amongst the workmen; complaints were continually being received of the indolence and apathy of the workmen of all trades. In accordance with the instructions of the Council, the Standing Committee on Trade Questions called a conference with the bricklayers, carpenters and joiners, labourers, masons, painters, plasterers, and smiths to consider several local strikes which had taken place in connection with certain trades, and had been the cause of much friction and annoyance, more especially as it was understood that such strikes had been promoted by local lodges. The conference was held on July 18, and a long discussion took place. In the end it was decided that the representatives of the various trades should meet with the object of trying to form some central authority without whose sanction no strike should be allowed. The trades which had given the most trouble were the bricklayers and plasterers. The operative plasterers had been in communication with the Council with reference to apprentices, and as the Council considered that it would be in the interest of the trade to have a greater number of apprentices they informed the National Association of Operative Plasterers that they would be pleased to confer with them on the subject, but, as a very large number of master builders did not do their plastering, but sub-let it to master plasterers, they wished the Master Plasterers' Association to be consulted. This, however, the operative plasterers declined to do, consequently the matter was still in abeyance. The Council had had under their consideration the Plumbers' Registration Bill, the Employers' Liability Bill, the Conspiracy and Breach of the Peace Bill, the Hours of Labour Bill, and the Notice of Accidents Bill. With regard to the former, Mr. Lee Knowles, M.P., who was in charge of the Bill, had promised to take the necessary steps to include the Institute of Builders with the various bodies from among whom members of the General Council on Plumbers' Education and Registration may be elected. With regard to the Hours of Labour Bill, and the Notice of Accidents Bill, the Council presented petitions against them, the latter Bill being subsequently withdrawn. As the Conspiracy and Breach of the Peace Bill would probably be favourable to employers of labour in the event of strikes, no action was taken. As members were aware, the Employers' Liability Bill, after passing the House of Commons, was sent back by the House of Lords with various amendments, with which the Commons disagreed, and sent the Bill up again with their reasons for disagreeing. The Lords have since decided to insist upon their amendments. In accordance with the rules it would be necessary to elect two auditors and three elected members of the Council. The three elected members of the Council who retired were Messrs. Wm. Scrivener, R. Thorne, and B. E. Nightingale, all of whom were eligible for re-election.

After discussion it was resolved unanimously: "That the audited accounts and report of the Council for the past year be received and adopted." The retiring members of the Council and the auditors having all been re-elected, the proceedings terminated with a vote of thanks to the Chairman.

**WESLEYAN CHAPEL, READING.**—A new Wesleyan chapel has recently been opened at Reading. The building is situated in the main thoroughfare, has cost about 4,500*l.*, and has been carried out from the designs of Mr. F. Boreham, of London, by Mr. Samuel East, builder, of Reading.

## ARCHÆOLOGICAL SOCIETIES.

**BRITISH ARCHÆOLOGICAL ASSOCIATION.**  
At the last meeting of the Society, held on February 7, the chair was taken by Mr. Allan Wyon, F.S.A., Hon. Treasurer. It was announced by Mr. Loftus Brock, F.S.A., Hon. Secretary, that an invitation had been received from the Lord Mayor of Manchester for the Association to hold this year's congress in that city, and that the invitation had been accepted. Mr. Cecil Davis described some finds of prehistoric stone implements near Auckland, New Zealand, and exhibited two examples. The Rev. J. B. Lewis reported the existence of an early font at Tolla Porcorum Church, Dorset, which he supposes to have been a Roman altar. Mr. Barrett described a Medieval column, now in a cellar at Castle Hedingham. Dr. Fryer rendered a 'description of the casting of the bells of Llantrissant Church, S. Wales, in the tower of the church, in 1718. This led to a discussion with respect to the custom of casting bells on the spot by various itinerant bell foundries, and many instances were reported. Among these, Mr. Earle Way described the Bell pit Field at Templeton, near Tiverton, where the church bells are believed to have been made. A paper on Ecclesiastical Antiquities was then read by Mr. A. Oliver, illustrated by an exhibition of many examples of crucifixes, and other objects of varying dates, indicating much diversity of design. Various positions of the Saviour's head were shown, and in one example both hands were placed over the head. Some of the crosses were made to open to contain relics, and an example, found in the Minories, had three cherubs' heads at the extremity of each arm of the cross. Among the examples was an elegant Pax of fourteenth-century date, in a framework a century or two later. The second paper described an antiquarian tour in East Anglia made by Mr. T. Cann Hughes. Many of the lesser known churches of the district, as well as others famous for their architectural beauty, were described.

## Correspondence.

To the Editor of THE BUILDER.

### PARTY STRUCTURES.

SIR,—I shall be glad if you will allow me to direct attention to the "rights of building and adjoining owners," as dealt with in Part VII. of the proposed London Building Act, 1894. Building owners, who have wished to be able to read the law more easily than by cross-reference to a number of Acts, and who have thought that there are faults in some places, will find that the Bill does not merely consolidate, but alters and adds to existing provisions. Clauses from the various Acts have been brought together, and there are novelties also.

The building owner will have, by express provision, the right (in some cases the duty) of underpinning his neighbour's building—not only the party structures as at present, but other parts as well. Perhaps he will regret that he will have to deal, not only with an adjoining owner, but with the lessee and occupiers of the adjoining building, when he has to compensate them all. Perhaps he may at times find it difficult to commence his work, within six months of the service of the notice which started the negotiations. This may well be the case when the contract cannot be entered into till the awards of a number of sets of surveyors have been made. If the six months pass without a good beginning, all negotiations and awards will be invalid, and he must begin again. Umpirage will be substituted for the joint award of surveyors, which has been the rule for about forty years. These and other provisions show no desire to adhere closely to existing customs.

The changes may be wisely conceived; but, as anything which seems to put fresh burdens on the building owner may discourage building, it would be well if the balance of public benefit could be ascertained. Take, for instance, the case of underpinning just alluded to. When it is intended to carry down any portion of a new building within 10 ft. of another building to a lower level, the building owner may be compelled (subject to award) to deal with the whole of the foundations of his neighbour's building, also to make and maintain everything necessary "for the protection of the adjoining building and the security of the adjoining occupier." Though he may have acted exactly in accordance with the award of the surveyors, he is not to be relieved "from any liability to which he would otherwise be subject in case of injury by his building operations to the adjoining owner." If the adjoining owner, within a month or two of the completion of the underpinning, chooses to lower his lowest floor also, the building owner cannot obtain from him any part of the expenses incurred. The "security of the occupier" is, of course, a novelty. It is not clear whether it is to include adequate protection against burglars—an effective

guardianship of the premises—as well as security against split walls, shaky ceilings, and damage from falling materials. Such provisions solve questions about "right of support" by a short cut. This case may serve as an example of others, which have made some building owners in depressed spirits, and may themselves be regarded by law-makers as a sort of criminals. I trust, however, that Hope will still spring eternal in their breasts.

In the article on the proposed Bill in your issue for the 20th ult. you mention that such words as "the utmost possible encouragement and the least possible hindrance to intelligence" might well be put in the preamble. The creation of new buildings, giving improved accommodation on the same site, has been spoken well of. The owner of property adjoining an improving owner may not, for the moment, deem himself the most fortunate of mankind; but very ample protection for him may be dearly purchased if enterprise is discouraged. I intended to make and support by brief argument, some suggestions tending to redress the balance to some extent, as I do not wish to see building regarded as a thing to be avoided. I will, however, merely ask for space for the suggestions themselves, and omit the arguments.

1. The task of communicating with his own lessee and occupiers should be thrown upon the adjoining owner, when he has received the notice from the building owner. Some method should be devised for consolidating the opposition instead of every man fighting for his own hand.

2. The adjoining owner should be bound to give security when required, not only for the work done under his requisition (Sec. 79, clause 2), but also for all the work which he will have to pay under the award. The building owner may be required (Sec. 79, clause 1) to give security for the payment of all costs and compensation. This alteration would make things even.

3. In all cases of defective party structures the surveyors should be able to demand that the expense of rebuilding the premises of the adjoining owner (shoring, temporary partitions, &c.), should be shared, not borne wholly by the building owner, as proposed by Sec. 75 (2) of the Bill.

4. The provisions of the 1844 Act (Sec. 24), of something similar, should be enacted, so that the position of the party structures can be settled by the award, and the surveyors empowered to award compensation (if any) "in view of the lessening of the building, or for such other injury (if any) as shall be occasioned" by the adjustment.

5. The surveyors should be able to let the building owner go to work quickly. It should not be absolutely necessary for him to be kept waiting till three months have expired (Sec. 75) (8).

6. When a party structure is added to or raised the adjoining owner should pay a share when he uses more of it; the contrary in Sec. 80 (2) (a) of the Bill.

7. If a building owner chooses to erect his own external wall, adjoining an old party wall, he should not be liable to pay charges in respect of the rebuilding of the old party wall, which he left standing—probably to oblige the adjoining owner by not laying his premises open (the contrary under Sec. 80 of the Bill).

8. Such an external wall should not be used as a party wall unless the adjoining owner pays his share for work and land. If, however, the adjoining owner goes to the expense of rebuilding the party wall (as a complete wall without openings, &c.), then it might be fair that the other owner should be taken to have abandoned all claim to the land, on which that wall stands.

9. There should be a right to block up, at the expense of the person making them, openings in external walls abutting on other premises. This was provided for in Sec. 27 of the 1844 Act, but probably forgotten by the framers of the 1895 Act. Some such provision will be very advisable now that it is proposed that "a wall between two buildings differing in height shall be deemed to be a party wall (only) to a height of 10 ft. above the roof of the lower building" (Sec. 45 of the proposed Bill).

This last provision (9) might protect either owner against the other, and would be fair all round: and I venture to think that, although mainly in favour of the building owner, the other alterations I have suggested would also be fair, and that they should therefore find their places in any new Building Act for London. F.R.I.B.A.

### WHITEHAVEN UNION INFIRMARY COMPETITION.

SIR,—In addition to the eccentricities in the above-named competition, referred to by your correspondent, "Non-Competitor," of last week, I have to name also to you that (1) No assessor will be appointed; and (2) No plan or levels of the site are to be obtained. On application for these last, one is politely informed that one may survey the site for himself; and take levels, too, I presume. Now Whitehaven is not a place that might be considered central, or even easily accessible, and here many scores of able-bodied men are employed, and how can they take the risk of a long journey and to do their work for them gratuitously, besides paying all expenses, no one out of the "cannie North" can tell; but perhaps the information is withheld, not



the interests of the ratepayers, but in those of local competitors. An architect may be excused for thinking that when he lays before a Board all his office-work on their schemes for nothing, he has done enough; and that he ought not to be asked to present them with plans and levels of their land in addition. But with such requirements as these, and the surreptitious guineas demanded in other cases, competitions are really not fit to think about, and the profession has fine opportunities to follow the advice so generously offered to it of late, namely, of practising its art without reference to the means of livelihood. So far as I am concerned I insist upon being PAID FOR MY WORK.

February 13, 1894.

## The Student's Column.

### THE STRUCTURE AND PHYSICAL PROPERTIES OF BUILDING STONES.—VII.

#### STRENGTH.

**B**y the strength of building stone we mean its relative capability, in practice, of withstanding compressive and other forces brought to bear upon it. This has attracted more notice, perhaps, than any other of the physical attributes of stone, but we have no space to deal with it at any great length, and it is doubtful whether the majority of the innumerable experiments carried out are sufficiently reliable to merit much notice. We may, however, give a brief review of the essential features of the subject.

The quality of strength is regarded by most users of stone as of more importance than almost any other of its characteristics. If we did not know this from experience, the ubiquitous stone merchants' circulars, if we care to peruse them, continually remind us of it. There is a vague impression abroad, because the granites and other highly crystalline rocks require a greater weight to crush them than do the earthy limestones and sandstones, that a graduated scale exists in Nature between these extreme types of stone, and that the quality of an intermediate kind may be readily gauged from its relative position in that scale, as deduced from experiment. A more erroneous impression could not exist. Each class of stone must be regarded on its own merits, and viewed from other standpoints than its capacity to resist compression or tension. Of late years it has become pretty generally recognised, especially on the Continent and in America, that the practical value of "crushing strengths" has been enormously exaggerated. Apart from the indifferent manner in which experiments bearing on the subject have mostly been carried out, it is urged that the weakest stones dealt with show themselves capable of bearing a much greater crushing load than they are ever called upon to carry when built up—even in the largest edifices. Hence it is argued that their strength is only of secondary importance. And there is a real deal of truth in this.

Some, however, are still of opinion that tests are highly desirable, and their views of the matter are ably expounded by Professor Unwin, R.S.E. He remarks\* that a block of stone at the base of a pier or in an arch ring is subject to thrust due to the weight of the structure, and, as far as the condition can be secured, the thrust is not to the faces of the block. "Generally, the pressure does not reach to tons per square foot; though in some lofty structures it reaches up to 30 tons, and possibly in some arch rings up to 50 tons per square foot. Now, the crushing resistance of stone, tested in small cubes, is seldom less than 250 tons, and often reaches 1,000 tons or more per square foot." (Many figures, we may mention, never exhibit greater strength, however, than 130 tons per square foot.) The cubical form is a stronger one than that of the blocks used in buildings, and single blocks are stronger than aggregates. Further, it is quite possible in any actual structure to secure a simple condition of crushing stress. "Settlement, perfect bedding, unequal compressibility of different blocks, and other causes, introduce unforeseen and incalculable straining actions. Hence, the real factor of safety is not nearly as great as the nominal one"—all of which we thoroughly endorse. We may add that the difficulties of the case are further aggravated by the effect of the unequal expansion due to variations of temperature as explained, in another column, in our last article; and also by the implications that arise immediately the material commences to decay.

It seems to us that the argument is best judged in this case not from the laboratory, but from the known effects of pressure on the stone when used. He would be a bold man indeed who asserted that the key-stones of arches never give way from this circumstance. This may be, and no doubt mostly is, due to bad cutting in the mason's hands, or bad building; but that is just what has to be contended with—the stone should be strong enough not to feel it. Who could pass under Holborn Viaduct and attentively regard the massive granite pillars on which it is supported, and then tell us that stone—even a best-quality granite—is always strong enough to bear the stresses called into play, in practice? We do not find fault with this particular granite, quite the contrary; we make no complaints as to the foundations; nor inquire whether any settlement has taken place; or whether the pillars were cut truly; or were badly constructed or designed; or were cracked during transit from the quarries. All we desire now is to emphasise the fact that owing to some circumstance the stone has cracked in certain places, that it was not strong enough to deal with the simple or complicated stresses to which it has evidently been subjected from some cause or another. Many other instances might be quoted. In short, it is useless to argue that the knowledge of the strength of a stone is not of some value for building purposes. Certain oolites have a "crushing strength" of only 60 tons per square foot, and this is perilously near the stress to which they might possibly be subjected in large buildings.

As Professor Hudson Beare pertinently remarks,\* engineers, who would never dream of employing iron and steel without careful tests, accept large quantities of stone without any form of test, trusting merely to a casual examination. Although stone is not subject to the imperfections and carelessness of manufacturing processes, still, like all natural substances, it varies greatly in quality, and hence the need of tests is just as great as in the case of manufactured articles.

That is very true; but are the methods at present adopted in experimenting on the strength of stone capable of giving us its true compressive resistance? Are not the results obtained on one and the same material, say, on cubes cut from the same block, often so widely divergent as to incur a slight suspicion that, after all, the experiments are of but little practical use? Let us consider the results arrived at by Professor Beare, which we select as being recent, and as having been carried out with scientific precision, with first-class machinery and appliances. We have constructed the following table from data derived from this source, which shows at a glance the enormous variation in strength of some prominent British building stones:—

Table showing variation in strength of building stones.

Class of Stone.	Name of Quarry, or Stone.	Crushing Load on cubes per sq. ft. in tons.		
		Lowest result.	Highest result.	Difference in lbs.
Sandstones.	Purham (Four stones quarry) .....	1,150	517	1,150
	Cornwall .....	97	457	2,200
	Crags .....	370	710	410
	Corswall .....	347	57	235
	White Grimsby .....	1,115	245	714
	Hercules Ridge .....	1,800	307	110
	Lightcliffe (bed 3) .....	1,002	1,090	120
Dolomites.	White Mansfield .....	1,155	545	135
	Yellow Limestone .....	351	703	1,001
	Ainston .....	217	327	414
Oolites.	Ancaster .....	428	621	1,100
	Pottland (Base Bed) .....	240	354	218
	Ketton .....	71	128	57
	Corsham Down (Bath Stone) .....	71	128	57
	Fairleigh Down .....	21	61	110
	Box Ground .....	81	125	44
	Stoke .....	704	116	301
Granites.	Westwood Ground .....	297	140	507
	Dyce (Aberdeen) .....	908	1,255	144
	Saltaire .....	612	970	208
	Bea Cruachan .....	765	1,005	110
	Corranie .....	1,098	1,417	310

The author, referring to the whole of his tables, from which the above form a large selection says—"It will be seen that the figures for crushing loads are very closely concordant." We are sorry to have to dissent from this view, they seem to us to point to an exactly opposite conclusion; but we are quite willing to leave the matter with the reader—the figures speak for themselves.

\* Min. Proc. Inst. C.E. vol. cvii. (1892) p. 357.

One thing we have never been able to understand in reference to the method of recording the crushing strength of building stones, is the practice of stating the mean strength of several samples, instead of the lowest. We rely on the principle embodied in the dictum that "the strength of a chain is the strength only of its weakest link." Still more are we at a loss to comprehend the practical value of lumping together a number of stones of the same class, but from different quarries and districts, and calculating the mean strength of the whole. Thus, we learn with reference to the crushing experiments just alluded to (which, however, are by no means isolated in this respect) that the granites showed a mean strength of 1112.2 tons per square foot; oolites 141.3 tons; sandstones 489.8 tons; and dolomites 500.5 tons. Such figures can have no practical value for reasons that are very obvious when they are compared with those in the above table. We notice, for instance, that sandstones vary from 171.5 tons to 1,090 tons per square foot; dolomites from 281.7 to 703.8 tons; oolites from 58.1 tons to 141.7 tons. The range of variation in the same stone, as we plainly see, is in some instances more than two-thirds the strength of the lowest result, and great differences are, in almost every case noted, very apparent; to strike a "mean strength" under such circumstances can be of no use whatever to the architect or engineer.

Another thing to which we take exception is the testing of very small (2 in. to 4 in.) cubes of stone and calculating from the results the crushing strength per square (or cubic) foot. General Gillmore found\* that within certain limits "the compressive resistance of cubes per square inch of surface under pressure increases in the ratio of the cube roots of the sides of the respective cubes expressed in inches." From this it naturally follows, as Mr. Merrill has remarked, that ambitious dealers desiring any stone to show great power of resistance would select the larger-sized cubes to be experimented upon. It would appear, however, that the law above given does not hold good for blocks of large size, such as are used in actual building.† We very much doubt whether any set formula, even when drawn up by such a careful observer as Professor Bauschinger, or Dr. Böhme, is capable of being applied to estimating proportional increase in compressive resistance from small cubes to large. There are so many uncertain elements in the way. Where a 2-in. cube has been experimented with it may be that the resistance was controlled by large shells. To anticipate a little, we have discovered, by means of the microscope that nearly all non-crystalline stones have a species of concretionary structure set up in them, which is not apparent to the naked eye. The concretionary portions are naturally stronger than the normal stone, and they are fairly close together in certain varieties. Chance has hitherto determined whether cubes of normal, or of concretionary stone have been experimented with. A large block of stone might develop (and often does) minute cracks that weaken it very materially; these would not be apparent on a carefully-selected 2-in. cube.

It has often been remarked, and has been shown experimentally, that the shape of the piece of stone to be tested is also a controlling factor in regard to its strength. As a rule, cubes are selected for this purpose, though we know that stones of this shape are not very frequently used in actual construction; here, again, is an unknown quantity. A number of formulae of more or less value have, however, been drawn up to enable us to arrive at approximate conclusions. It may be useful to record the following:—

1. The strength of geometrically similar test pieces varies as the square of homologous sides.†  
2. The variation of the crushing strength of prisms with the form of the cross-section has been determined by Rondelet; with prisms of circular, square, and triangular bases of equal area, the strengths were proportional to 1 : 0.93 : 0.86; and for prisms on a square base, and rectangular base, with sides as 1 : 2 of equal area, the strengths were as 1 : 0.95. As Professor Unwin remarks, these numbers are nearly in the reciprocal ratio of the square roots of the circumferences.

3. When cubes are used for columns, placed on each other, the strength diminishes with the number of cubes.

4. A single block is always stronger than a

\* Annual Report of Chief of Engineers (United States), 1875.  
† Gillmore, "Notes on the Compressive Resistance of Free-stone," &c. (1888), pp. 20-29.  
‡ Unwin, *Op. cit.*, p. 422.

"The Testing of Materials of Construction," 1888, p. 112.



compound one of the same form made of separate blocks without cement.

We cannot dismiss this subject without referring to other grave errors introduced in results of experiments in crushing building stone by one or some of the following:—

a. Crushing the stone before all the quarry-water has dried out.

b. Not experimenting with perfect cubes, and using sheets of lead, pine, &c., between the dies of the machine to "distribute the pressure," whereby the real strength of the stone is greatly diminished.

c. Crushing abnormal specimens, or samples sent to be operated upon by peculiarly interested parties.

A series of experiments showing the strength of stone when saturated with water is highly desirable. From the nature of things we know that building-stone is hardly ever quite dry, whilst it is frequently soaked with water, or exposed in damp situations. The absorption of water must materially alter its relative strength in many instances.

The foregoing observations are sufficient, we think, to show the great difficulty in estimating the strength of stone, under certain conditions, in the building, and also in the laboratory. For our own part we have discovered a mathematical process of ascertaining the strength of stones from the relative ratio of their capacity for absorbing water. The close connexion between "strength" and "absorption" we have pointed out on a former occasion, but the whole is dependent on structure, and we therefore prefer to reserve demonstration of this until the end of the series, when the student will understand more about the structure of building-stone.

#### GENERAL BUILDING NEWS.

**ALTERATIONS TO BREWERY, DERRY.**—The Derby Brewery, Nottingham-road, Derry, is to be further altered, and a new chimney-stack erected from the plans of the company's architect, Mr. R. E. Carpenter, of Burton-on-Trent, the builders being Messrs. Oldershaw, of Chaddesden.

**PROPOSED NEW CHURCH, ABERDEEN.**—It is proposed to erect a new parish church in the district of Killybrewster, Aberdeen. Only the main body of the church, or nave, will be built at first, at a cost of 2,500*l.*, and to accommodate 500 worshippers; but it is hoped soon to complete the design at an expenditure of 5,000*l.*, and provide 800 sittings. The material used in the construction will be light grey granite. The architect is Mr. A. Marshall Mackenzie, Aberdeen.

**INTERMEDIATE SCHOOL, PORTH, G. MORGAN.**

—The memorial stone of the Porth Intermediate School was laid on the 5th inst. by Mrs. L. E. Picton-Turbervill. The school, which is one of thirteen to be established throughout the county, under the provisions of the Welsh Intermediate Education Act, will provide accommodation for over 200 boys and 80 girls, and the estimated cost is 4,675*l.* The architect of the school is Mr. Jacob Rees, Pentre, and the contract has been placed in the hands of Messrs. Charles Jenkins & Sons, Porth.

**WESLEYAN SCHOOLS, NORTH SHIELDS.**—New Wesleyan Sunday Schools have just been opened in connexion with the Wesleyan Memorial Church, Albion-road, North Shields.

The new buildings consist of a lecture hall 51 ft. by 39 ft. with class-rooms, each 17 ft. by 16 ft., at the platform-end of the hall; with an infant-school behind the platform 24 ft. by 19 ft.—affording accommodation in classes for 354 children. The class-rooms have sliding partitions. In addition to these ground floor rooms, on the first floor are other rooms. The building is connected with the Memorial Church by a covered corridor. This will form the main entrance from Albion-street to the lecture-hall for the boys, while a second entrance from the new street in the east side gives a separate entrance intended to be used by the girls and infants. In addition to these buildings there is provided a residence for the caretaker. The lecture-hall, &c., is heated by hot water, the boiler for which is placed in the basement. Externally the buildings are made to be in accord with the church, and the walling in stone is similar. The lecture-hall presents a gable to the south, with two three-light refoiled windows in the lower part separated by a buttress. In the upper part of the gable is a large circular window. The elevation presents a double gable to Drummond-terrace, with a moulded arched doorway on ground floor, with necessary windows to the various apartments. Internally the lecture-hall has an open collar-beam roof with wrought-iron principals. Honeyman's patent roof ventilators have been used. The buildings have been erected by Mr. T. W. Weir, of Howdon, the local sub-contractors being Messrs. Addison & Sons for slating, Mr. Heslop for plumbing, Messrs. Dining & Cooke, of Newcastle for heating engineers' work, and Mr. Steel for smith's work. Mr. F. R. N. Haswell, F.R.I.B.A. (from whose designs the church was built) is the architect.

**MIDLAND RAILWAY INSTITUTE, DERRY.**—A new Midland Railway Institute has just been built

at Derby from the designs of Mr. C. Trubshaw, the Company's Architect. It is a two-story building of red brick with terra-cotta panels and string-courses. The entrance-hall, 17 ft. 6 in. wide and about 40 ft. long, is entered through iron frontage gates and swing doors. On the right is the newspaper room, 44 ft. by 40 ft. Leading from the newspaper room is the magazine room, about 20 ft. by 20 ft., and from this apartment access is gained to a chess or class-room. There are also a coffee-room, a small kitchen, larder, and other offices. To the left of the entrance-hall is the library, 26 ft. long by 35 ft., and a committee room. There are two staircases leading to the rooms above, one from the front hall, the other from the back. The latter leads to the stage of the concert-hall and the dressing-rooms at the back. Immediately on the top of the front staircase is a class-room, and on the left-hand side is the concert or lecture hall. This hall is capable of seating upwards of 600 people, being 45 ft. by 67 ft., and is provided with proscenium and stage. The billiard-room to the right is 49 ft. by 27 ft. The electric light has been used all through the building. The contractor for the new Institute is Mr. W. Dickinson, builder, Ashbourne-road, and Mr. C. Smith is the clerk of works.

**ST. STEPHEN'S SCHOOLS, WOODVILLE, NEAR BURTON-ON-TRENT.**—These schools are to be altered and enlarged from plans by Mr. R. E. Carpenter, of Burton, as approved by the Education Department.

#### SANITARY AND ENGINEERING NEWS.

**EXTENSION OF CORPORATION WATERWORKS, ABERDEEN.**—Work has been provided at Catfield for men otherwise unemployed, in making the excavations for a new concrete service reservoir, of oblong shape, 265 ft. long, 130 ft. wide, and 12 ft. deep. This new reservoir is intended to give a supply to the higher-lying districts round Killybrewster, and also to the lower reaches of Woodside and to the whole of Old Aberdeen. This arrangement will reduce the present strain on the mid-service reservoir at Slopefield, as the new reservoir will be supplied from the low-service reservoir at Mannofield by a 24-in. cast-iron contour main, which is at present being laid by the Corporation's water staff. This main will be 3½ miles in length, and will supply certain other districts *en route*. The pipes alone will cost 11,000*l.*, the contractors being Messrs. Macfarlane, Strang, & Co., Lochburn Ironworks, Glasgow; and the total cost of the section of the works mentioned will be 25,000*l.* The other works authorised by the Local Act of Parliament passed last year are (1) an additional circular storage reservoir at Invercaannie, 650 ft. in diameter, with a water depth of 12 ft. 6 in., to hold 30,000,000 gallons, giving with the existing reservoir a total storage equal to about five days' supply in place of thirty hours at present; (2) six additional filter-beds to filter one million gallons each daily, which, with the existing filter-beds, would filter the whole supply to the town, and permit of one filter-bed being out of rotation, so that the beds can be cleaned regularly in rotation; (3) at the villages of Breamare, Ballater, Aboyne, and Kincardine O'Neil above the town, the length being 12 miles, of irrigation farms, with all the necessary concrete channels, sluices, &c., for carrying and distributing the sewage to the different parts of the land, these last-mentioned works being designed to prevent as far as possible the pollution of the Dee, and consequently of the Aberdeen water supply. Mr. William Dyack, Beach Surveyor, Aberdeen, is resident engineer for all of the above works, and Mr. James Gale, of the Glasgow Corporation Waterworks, has acted as consulting engineer. Over and above the cost of the Catfield reservoir specified above, the expense of the waterworks extension works described is estimated at 60,000*l.*

**DRAINAGE WORKS, NORTHAM, DEVON.**—For the new sewer for the drainage of Orchard Hill, Northam, Messrs. G. Shellbear & Son, Plymouth, are the contractors, at a price of 2,500*l.* The works have been designed, says the *Western Morning News*, by Mr. Baldwin Latham. The sewer commences at Raleigh Gate, and discharges at Lower Cleave houses, the length being one mile. The stoneware pipes, of 10-inch and 12-inch diameter, and of extra thickness, run into a tank sewer, at Cleave houses, of 4 ft. 6 in. diameter, 200 yards length, and 30,000 gallons capacity, and constructed of brick (on the inside) and concrete. The discharge takes place through 1,380 feet of 12-inch iron pipe, which will be placed at low water. Between the tank sewer and the iron pipe, the situated the tidal flap and penstock chambers. Two automatic flushing tanks, each of 650 gallons capacity, will be placed at the beginning of the drain and the entrance to Chanter's-lane respectively. The sewer will be perfectly straight from manhole to manhole. All turns take place in the manholes, and the floors of the latter have the same form as the pipe, so as to avoid accumulations. The surface boxes of the manholes will be air-tight, and ventilation will be carried out by means of six ornamental iron columns, 30 ft. high. The sewer will be laid at a depth of between 7 ft. and 20 ft. The resident engineer for the works is M. A. J. Jenkins, and the contractors' representative is Mr. H. B. Neal.

#### FOREIGN AND COLONIAL.

**FRANCE.**—In accordance with a Parliamentary vote, the Minister of Fine Arts has just opened a competition for three architects' appointments in connexion with the Département des Monuments Historiques. The "projects" of the competitors, twenty in number, are at present exhibited in the Museum of Comparative Sculpture at the Trocadère. The architects were left free to select, from among the civil, military, or religious buildings from the eleventh to the sixteenth century, the monument of which they wished to represent the actual state and a restoration. The works exhibited show for the most part a high average of learning and talent. We may mention especially the drawings submitted by M. Lucien Roy ("Eglise de la Chapelle" at Crécy), M. Benouville (St. Julien le Pauvre, which he proposes to transform into a museum of specimens of the stone), MM. Nodet, M. Marec, Balleysguier, Bonny, and Babel. In addition to this competition of drawings, the competitors have also to pass an oral examination in history and archæology.—Seventy-two architects have taken part in the competition for a new Hôtel de Ville for Paris-Seine. The designs are exhibited in the Palais des Arts at the Champ de Mars. Many of them are splendidly drawn, but the majority have the fault of being too pompous and pretentious, and at variance with the simplicity which is more suitable to a suburban town hall.—At the Ecole des Beaux-Arts the "Prix Labarre" has been awarded to M. Blondel. The prize is given to the student whose sketch is judged to be the best specimen of the subject. The "Prix Fortin" has been awarded to M. Rouault.—We may notice in passing the picture exhibition organised in Rue Buonaparte by the editing staff of the journal entitled "La Plume," and that of the landscape-painters MM. Schœnleber, R. Schœnleber, in Rue St. Lazare. The eminent sculptor Cavelier, whose death we mentioned recently, has left two *rentes* of 1,500 francs each, one to the Société des Artistes Français, the other to the "Société des Artistes Peintres, Sculpteurs, Architectes et Graveurs," founded by Baron Taylor.—The decoration of the new Ecole des Beaux-Arts is being completed by four large panel pictures to be executed by M. Besnard.—The Sevres manufactory is still at work at a dessert-service which is to be offered as a wedding present to the Duke and Duchess of York. It will consist of two jardinières, four large fruit baskets, and forty plates.—M. Mercier will exhibit at the next Salon the monument which is to be erected on a pedestal in front of Joan of Arc's house. The inauguration will not take place, however, for two years.—M. Bonnat is to represent the committee of the Société des Artistes Français, at the Fine Arts Exhibition at Vienna. M. Ernest Barrias has been appointed vice-President of the same society. In place of Kléber in Algeria, intend to raise in this small town a monument to General Kléber.—M. Antony Jolly, architect, a former pupil of the Ecole des Beaux-Arts, has been appointed architect to the French residencies at Madagascar.—Experiments are being commenced at Nice for the disinfection of sewage by electricity, sea-water, the engineer, M. Herminet, of the railway company "de l'Ouest" has commenced the construction of a new station at Montreuil, near St. Cloud.—The "Conseil Supérieur des Prisons" has expressed itself in favour of the suppression of the prisons of Mazas, Grande Roquette, and Saint-Pélagie, and of replacing them by the establishment of the single penitentiary which is to be constructed in the department of the Seine-et-Marne, and will be capable of containing 1,800 prisoners.

**NORWAY.**—Herr Henrik Bull, architect of the new National Theatre now in course of construction in Christiania, a "model" structure, has given a lecture on the scheme at the Polytechnic School. The lecture was well attended, and the stage will be in two buildings, absolutely separated, except for a necessary door in the basement and one on the first floor, both fireproof, and for the scenery, but which may be completely closed with an iron curtain. The main entrance will be through a portal in University-street. This leads to a vestibule, in which the doors and stairs will be located, the pit, and the *loges*. At the close of the performance special doors from the lower parts opening directly on the street will be thrown open. The Royal box will have a separate entrance, vestibule, and *foyer*. On the second floor is the first tier of boxes, with the principal *foyer* or lounge situated over the roomy vestibule. To the third floor—second row of boxes—the *foyer* is continued from the second floor, and outside are balconies whence iron ladders lead down into the street. On the fourth floor is the gallery, whence there are also iron fire-escapes. The basement is set apart for the orchestra, and has a separate entrance. The stage-building—i.e., the structure at the back—reached through the entrances from another street, in the basement of



which there are rooms for the officials, per-  
mers, &c. Around the stage runs a corridor, in  
which are the dressing-rooms, wardrobes, &c.  
There is also a *oyer* for the use of the actors and for  
bears. The stage rises right through the entire  
aiding to the dome. Above the first-floor corridor  
another floor, with dressing-rooms, and a sitting-  
om for the chorists. On the third floor, at the  
ack, is the curtain storage, the tailors' workshops,  
the artists' studio. In the loft is the  
larger shop. At the back of the stage is a  
pecial exit, approached by sloping terraces, so  
ge that a fire-engine, all complete, may drive  
rough it right on to the stage. In fact, no prelu-  
on has been omitted in order to ensure exactness  
and safety from fire, the stringent regulations  
ow in force in Prussia and Austria as regards  
theatres having been strictly observed. Gas is not  
ed in any part of the buildings, only the electric  
ght, but in the corridors and on staircases, &c., there  
oil lamps and candles in reserve. The lower  
rt of the structure is to be faced with polished  
ranite from the Idelford, whilst the columns in the  
terior will be executed in polished Norwegian  
arble. The structure rests on 3,400 piles, ten  
yards in length, encased in concrete one yard  
in thickness. The entire surface is covered with  
tiles laid by the Christiania Cement Factory. An  
association of workmen has been formed in  
Christiania for the erection, on co-operative prin-  
ciples, of two-storied detached workmen's dwellings  
with a plot of garden attached 500 square metres in  
area. The dwellings are first to be let to the  
couple, but upon his having paid half the  
lease will be issued to him. It is not intended  
that any of the dwellings should be let to spread  
the dwellings all over the town. The principles of  
the association have been adopted from Germany.  
[SWEDEN.—It has been decided to postpone the  
opening of the projected Scandinavian Industrial  
Exhibition in Stockholm from 1896 to 1897, as in  
the former year similar exhibitions will be held in  
Berlin and Brussels, and because in the latter year  
the twenty-fifth anniversary of the reign of  
King Oscar. A Scandinavian Industrial Exhibition  
will, however, be held in Malmö in 1896.—The  
Stockholm Building Board has just arrived at a  
decision which has caused some comment in build-  
ing circles, i.e., having refused a building contractor  
license for business on the grounds that he has  
recently passed through bankruptcy. The  
board maintains that such a person is not in a  
financial position to contract for materials, &c.,  
and the refusal. In a recent case, it is pointed  
out, the vendors of building materials only received  
per cent. of their claims.]

[DENMARK.—A recent number of the *Ingeniør*  
contains designs and plans, with description, of  
the Town Hall in Copenhagen, on which work has  
commenced. It is the greatest undertaking of its  
kind considered in the Danish capital during the  
present century. The building will be centrally  
situated, surrounded by boulevards, on the site of  
the last Industrial Exhibition. The design chosen,  
the main, is one of three sent in by Herr M.  
Nyrop, the architect. The Town Hall will consist  
of front, central, and rear blocks, with a clock-  
tower. In course of time a square, with terraces,  
stages, &c., will be planned in front of the hall in  
order to make its appearance more imposing. The  
building will be built of red bricks, resting on a  
bed of Bornholm granite, 8 ft. in height. The cost  
of the building, with installations of steam, ventila-  
tion, sewage, electricity, &c., is estimated at about  
5,000,000, but it is generally believed that the sum  
will be exceeded.—The new Museum of Industries  
in Copenhagen is now completed externally, and the  
foundations have been removed.—Work on the  
Egyptian art gallery presented to the city by the  
Cairo Government is now progressing rapidly.  
The facade is to be decorated with six colossal  
sculptural groups in bronze, three on each side of  
the entrance.]

#### MISCELLANEOUS.

[OPEN SPACES.—At a recent meeting of the  
Court of Common Council a memorial was received  
from ratepayers, commoners, and inhabitants of  
St. Andrew, Surrey, asking for assistance in the  
proposed purchase of land at St. Andrew Commons—see  
page 120 of January 22 last week. The petitioners  
present that a former attempt to enclose the land  
had been successfully resisted, though at a cost to  
them of about 4,000l. for legal expenses, towards  
which the Corporation gave 1,000l. The inhabitants,  
however, have been obliged to resort again to  
agitation, spending 1,300l. in securing the assent of  
Parliament to a scheme by the Board of Agriculture  
for appointing conservators. A gift under the  
Metropolitan Open Spaces Act 1887 to the London  
County Council all their interest and duties of  
management in respect of the square-garden, with a  
view to its permanent preservation for public enjoy-

ment. The garden,  $\frac{1}{4}$  acre in extent, was laid out  
by the Metropolitan Public Gardens Association at a  
cost of 2500l. leased to trustees, and opened on  
August 10, 1887. A project is started to buy for  
6,400l. an open space of about 8 acres at Manor-  
land, Lee. The above-cited Association have  
obtained the consent of the respective rectors to the  
laying out of the churchyards of St. Mary, Bow, and  
All Hallows, London Wall; and have arranged  
with the owner of Iron-square, Hackney-road, for a  
forty years' lease, at a peppercorn rental, of the  
garden, and its use by the public. The Lewisham  
Board of Works have voted 2,800l. towards the  
purchase of Brockley Hill Fields, so now the total  
cost of 43,300l. (to which the London County  
Council give 22,000l.) for the 45 acres is assured.  
See "Notes" in the *Builder* of March 5, July 16,  
and November 12, 1892, and October 28 last, for  
history of the movement for purchase.]

[EXHIBITION OF METEOROLOGICAL INSTRUMENTS.—The Council of the Royal Meteorological  
Society have arranged to hold at 25, Great George-  
street, S.W. (by permission of the President and  
Council of the Institution of Civil Engineers), from  
April 10 to 20, an exhibition of instruments, photo-  
graphs, and drawings relating to the representation  
and measurement of clouds. The committee will  
also be glad to show any new meteorological instru-  
ments or apparatus invented or first constructed  
since the exhibition in 1892, as well as photographs  
and drawings possessing meteorological interest.]

[ILLEGIBLE SIGNATURES.—We have had to leave  
unanswered two or three letters during the last  
week, through the writers' signatures being illegible.  
Correspondents ought to remember that though the  
context will generally explain a badly-written word  
in the body of a letter, there is no such explanation  
for a badly-written signature. Nothing can be more  
stupid and unbusinesslike than to write to a person  
to whom your name is not known, with a signature  
which is either illegible or which may be read three  
or four different ways.]

[ROCHDALE BUILDING TRADES FEDERATION.—Mr. W. Mallinson, Secretary to the Rochdale and  
District Building Trades Federation, has just drawn  
up his report on the first year's working of that  
organisation. The report states that one of the  
most important subjects that has engaged the  
attention of the Federation has been the fair con-  
tract clause. The first public body they approached  
on this question was the School Board, where  
Councillor Rushworth at their request moved for  
the insertion of a fair contract clause in all con-  
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the insertion of a fair contract clause in all con-  
tracts for work to be done for the School Board.  
Although the motion found no second, the Federa-  
tion considers it was a useful means of introducing  
the subject to the notice of the public. Councillor  
Rushworth also undertook to move a similar resolu-  
tion at the October meeting of the Town Council.  
A long discussion ensued, but the resolution was  
rejected by 18 votes against 15. The Federation  
considers that many of the arguments used against  
the resolution had no bearing on the question, and  
they believe that when the motion again intro-  
duced in the Council the voting will be reversed.  
In reply to a communication sent to the Pioneers'  
Society, the Federation learned that "all contract  
work let by the committee of the Pioneers is given  
to men who pay the standard rate of wages."  
They consider this rather an evasive reply from a  
co-operative society, as no opinion is expressed on  
sub-letting. The Provisional Co-operative Society,  
in response to a request of the Federation, adopted  
a resolution admitting the principle of the fair  
contract clause, with the standard rate of wages,  
and no sub-letting where avoidable. To secure if  
possible a clause in the Town Council building regu-  
lations preventing jerry-building, the Federation  
were informed that when the time arrived a deputation  
would be gladly received and heard. Mr.  
Mallinson's report concludes, "There is every  
promise of the building trade being busy. Last  
year found us fairly well employed, despite the pro-  
gnostications of our employers. . . . We trust that  
our brethren in the surrounding district who receive  
a lower rate of wages than ours will adopt means  
to bring their wages up to our level. . . . At present  
the Federation is in its infancy, and before we reach  
its full effect as a principle we shall have to gain  
experience, and to show a broader spirit of brother-  
hood. This spirit is discernible in our unions, and  
with that and an earnest will, difficult problems of  
organisation will not be incapable of solution."

#### CAPITAL AND LABOUR.

[BUILDERS' LOCK-OUT AT NEWCASTLE.—The  
dispute between the Newcastle Master Builders'  
Association and the plasterers and bricklayers  
culminated on Monday in a lock-out, and through-  
out the last two societies being federated with  
joiners, plumbers, lathrenders, and labourers, these  
bodies of men are also stopped from continuing  
their employment. The dispute arose because the  
plasterers wished to compel a foreman to join their  
society, and the bricklayers to make a mason cease  
working as a bricklayer in a lock-out, and further to make  
an offending employer in the last-named case pay 5s.  
The Employers' Association have taken joint action,  
and thus ordered a general lock-out.]

#### MEETINGS.

FRIDAY, FEBRUARY 16.  
*Architectural Association.* Mr. J. L. Robinson on  
"The Last Three A. A. Excursions." Illustrated. 7.30  
p.m.  
*Sanitary Institute (Lectures and Demonstrations  
for Sanitary Officers).*—Professor W. H. Corfield, M.A.,  
on "Sanitary Appliances." 8 p.m.  
*Institution of Civil Engineers (Students' Meeting).*—  
Mr. Walter Beer on "Ship Slipways, having special refer-  
ence to the Dover Slipway." 7.30 p.m.  
*Painters' Hall.*—Mr. W. Fourniss on "The Processes  
of House Painting." III. 8 p.m.

SATURDAY, FEBRUARY 17.  
*Sanitary Institute (Lectures and Demonstrations for  
Sanitary Officers).*—Visit to Croydon Water-works and  
Beddington Sewage Farm, Croydon. 2 p.m.  
*Royal Institution.*—Lord Rayleigh, M.A., on "Light ;  
with Special Reference to the Optical Discoveries of  
Newton." II. 3 p.m.  
*Queen's College, Cork.*—Mr. Arthur Hill on the  
"History of Architecture." VI. 3 p.m.

MONDAY, FEBRUARY 19.  
*Surveyors' Institution.*—Adjourned Discussion on Mr.  
H. Blackburn's paper on the "London Streets and  
Buildings, Bill, 1894." 8 p.m.  
*Society of Arts (Cantor Lectures).*—Mr. Hugh Stannus  
"The Decorative Treatment of Artificial Plough." I.  
8 p.m.  
*Victoria Institute.*—8 p.m.  
*Liverpool Architectural Society.*—Paper by Mr. J. W.  
Blakey entitled "A Few Notes on Quantities and Specifi-  
cations." 6.30 p.m.  
*Leeds and Yorkshire Architectural Society.*—Paper  
by Mr. D. B. Niven. 7.30 p.m.

TUESDAY, FEBRUARY 20.  
*Institution of Civil Engineers.*—Mr. Ralph Hart  
Twissell on "Forging by Hydraulic Pressure." 8 p.m.  
*Society of Arts (Foreign and Colonial Section).*—  
Mr. Edouard Séve on "The Arts and Industries of  
Belgium and the Antwerp Exhibition, 1894." 8 p.m.  
*Sanitary Institute (Lectures for Sanitary Officers).*—  
Mr. J. Wright Clarke on "Details of Plumbers Work."  
8 p.m.  
*Royal Victoria Hall, Waterloo Bridge-road.*—Mr. J.  
Wesley Barry on "The Tower Bridge." 8 p.m.  
*Glasgow Architectural Association.*—Mr. George  
Walton on "Interior Decoration." 8 p.m.

WEDNESDAY, FEBRUARY 21.  
*Carpenters' Company (Free Lectures on Matters Con-  
nected with Building).*—Professor Unwin, F.R.S., on  
"Niagara and the Work for its Utilisation." 8 p.m.  
*British Archaeological Association.*—(1) Mr. Chas. R. B.  
Barrett on "Riding Skimming and Riding the Stang";  
(2) Dr. A. C. Fryer on "Stained Glass at Lambourn,  
Berks." 8 p.m.  
*Society of Arts.*—Mr. W. H. Preece, C.B., F.R.S., on  
"Electric Signalling without Wires." 8 p.m.  
*Sanitary Institute (Lectures and Demonstrations for  
Sanitary Officers).*—Visit of Inspection in the Parish of  
Chelsea. 2 p.m.  
*St. Paul's Ecclesiastical Society.*—Paper by Dr.  
J. Wickham Legg, F.S.A. 7.30 p.m.  
*Builders' Foremen and Clerks of Works' Institution.*—  
8.30 p.m.  
*Royal Meteorological Society.*—Three Papers to be read.  
8 p.m.

THURSDAY, FEBRUARY 22.  
*Institution of Electrical Engineers.*—(1) Mr. Gilbert  
Kapp on "A Method of Testing the Magnetic Qualities of  
Iron"; (2) Mr. W. M. Mordey on "A Parallel Working  
through Long Lines." 8 p.m.  
*Society of Antiquaries.*—8.30 p.m.

FRIDAY, FEBRUARY 23.  
*Sanitary Institute (Lectures for Sanitary Officers).*—  
Mr. W. C. Tyndale on "House Drainage." 8 p.m.  
*Institution of Civil Engineers.*—Students' Visit to the  
Paper Mills of Messrs. Johnson & Son, at St. Mary Cray,  
at 2 p.m.

SATURDAY, FEBRUARY 24.  
*Royal Institution.*—Lord Rayleigh, M.A., on "Light,  
with Special Reference to the Optical Discoveries of  
Newton." III. 3 p.m.  
*Edinburgh Architectural Association.*—Visit to Craig-  
dochie.

*Queen's College, Cork.*—Mr. Arthur Hill on "The  
History of Architecture." VII. 3 p.m.

#### RECENT PATENTS:

##### ABSTRACTS OF SPECIFICATIONS.

4,560.—VENTILATORS: *G. J. Chapman.*—In order  
to permit of air entering in gentle currents only, and to  
prevent draughts, ventilators are, according to this inven-  
tion, provided with balanced or spring-controlled valves,  
which effectually control the passage of air in the ventilator.  
4,737.—ARTIFICIAL MARBLE: *L. Nathan.*—According  
to this patent, the slabs or panels of marble to be imitated  
are made as they are fixed, so as to obviate the trouble of  
dowelling or fastening to the surface of walls or ceilings by  
plaster. The "marble" is made in a somewhat similar way to  
that ordinarily employed, but the facing is prepared on a  
removable surface and other details are introduced into the  
process in order to enable the material to be dealt with  
after it is in position.  
4,768.—FLUSHING CLOSETS: *H. W. McClellan.*—A  
pipe with nozzle is, according to this invention, fixed  
above the pan or receptacle, and an air pipe connects the  
discharge-pipe with the service-pipe, so as to ensure com-  
plete flushing with the greatest economy of water.  
4,765.—WINDOW SASHES AND FRAMES: *G. Clark.*—  
To allow the sashes to revolve for cleaning and repairing,  
the pocket-pieces in the sash-frame are made to draw out,  
and longer than the height of the sash, enabling the sash  
to slide sideways into the pocket-hole. The lines are fixed  
to the centre of the sash styles with small metal plates.  
The sashes clearing the beads in the frame are easily and  
conveniently reversed.  
4,744.—ARTIFICIAL STONE, PAINT, &c.: *L. Grate.*—  
Artificial stone, preservative paint, and such like manufac-  
tures are made by means of new combinations, "slag  
wool," gravel, clay, and many other materials being used.  
4,776.—WINDOW FRAMES: *M. Rendell.*—To facilitate  
the removal of the window-sashes, one of the beads of each  
window frame is hinged so as to enable the bead to be  
drawn out, fixing the window sash. If desired, the hinged  
bead may be secured by a bolt, clip, or fastener.





SEDGHILL (Northumberland).—For the erection of a building for the Co-operative Society. —

E. & L. George ....	£327	0	0	D. N. Spene.....	£420		
James Hynes .....	592	0	0	Jos. Oliver & Sons			
John Taylor .....	502	6	11	Killingworth*	373	0	0
H. Brown & Co.....	446	8	0		Accepted.		





## ILLUSTRATIONS.

Pierced Marble Screen, Cathedral of Roder, France.—Drawn by Mr. A. T. Bolton, A.R.I.B.A.	Double-Page Ink-Photo.
Mosque, Cairo, and Tombs of the Caliphs, Cairo.—Illustrating Professor Aitchison's Royal Academy Lectures	Two Single-Page Ink-Photos.
Donhead St. Andrew's Church: Proposed Chancel Aisle.—Mr. C. E. Ponting, Architect	Double-Page Ink-Photo.
St. Mary's Church, Horsell: Interior as restored.—Mr. W. F. Unsworth, F.R.I.B.A., Architect	Single-Page Ink-Photo.
Lodge at Chilton.—Mr. A. C. Blomfield, M.A., Architect	Single-Page Ink-Photo.

## Blocks in Text.

Cottages, Nisfield.—Messrs. I. Price & P. Tree, architects	Page 154	Estate Cottages, Linsford.—Messrs. Price & Tree, architects	Page 155
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### Arbitration and Conciliation.

**A**T the present time there is a good deal of loose talk upon "arbitration," as it is sometimes called, upon "conciliation" as it is termed on other occasions. It is desirable that the two terms should be kept separate and used for the purpose of expressing different ideas. Arbitration is a judgment after a trial; the most elaborate judgment by a Court of Appeal is in a sense an arbitration; but in popular acceptance an arbitration now means a trial in an informal manner and not in a court of law. But an essential element of a true arbitration is that the parties submit to be bound by the award of the person to whom the dispute is referred, and further, that the award or judgment can be enforced. In other words, in an arbitration the parties can be compelled by a superior power to submit to the decision of the arbitrator. Conciliation implies not a judicial investigation and an obedience to a decision, but a bringing together of two men or two bodies of men with a view to the arrangement of their differences under the guidance of a third party. The so-called trade arbitrations—that is to say, between bodies of persons such as employers and workmen—are conveniently called arbitrations, but they want one real element of a proper arbitration—namely, the power to compel the parties to the dispute to abide by the decision to which the arbitrator may come. This is the great weakness of all such arbitrations, and it is obvious that the only way by which the decisions of arbitrators who have to decide disputes between masters and men can be final is partly by educating workmen to see that it is impossible and wrong not to abide by a decision, even if it be unfavourable to them, and next, as was recently pointed out by Mr. David Dale, referee of the Board of Conciliation and Arbitration for the North of England Iron Trade, by making employers' and workmen's associations so preponderating an influence on each side that they virtually control the trade, and can give

effect to the decisions of the board of arbitration. There can be no doubt, indeed, that if powerful trade associations will be willing to abide by decisions as to rates of wages and so forth, they can practically compel individuals to submit to an arbitrator's decision. It is equally obvious, however, that this same strength may tell against these peaceful methods of terminating trade disputes, since an association or body of persons being more powerful than a number of isolated individuals for fighting purposes, can hold out against a reference to arbitration for a longer time than if their members were mere items. The recent struggle in the coal trade, indeed, has proved the truth of this statement, since there can be no doubt that had it not been for the corporate character of the opposing forces some kind of arrangement would have been come to among individuals sooner than was actually the case. So that while it is clear that powerful associations are in a position to make arbitrations effectual, it is equally clear that they are able to prevent them altogether, or defer them indefinitely. Passing back, however, for a short space to what may be termed individual arbitration, rather than arbitration between bodies of men, the question arises whether the State ought to facilitate and afford means for the decision of disputes. In other words, ought something in the nature of the new London Chamber of Arbitration to form part of the legal machinery of the land which is supplied by the State for the use of its citizens? On the whole it is best that the State should furnish Courts of Law, managed in a businesslike manner, in which the procedure is simple, and the trial of disputes expeditious, and should leave persons who desire that their disputes should be settled by arbitration to manage this matter for themselves. Arbitrations are not so numerous where a satisfactory legal system exists; and when an arbitration is really desirable, it is best left as unfettered as possible by rules and regulations. A rota of arbitrators, as provided by the London Chamber of Arbitration, seems at first sight to be a useful plan, but on consideration it will be found not to meet the true wants of those who resort to arbitration. In most cases the parties to an arbitration desire in the person who is to settle their dispute some particular gift, quality, or knowledge; others, again, may prefer a man

simply because they have a personal acquaintance with his capacity.

There are also many other details, connected with time and place, with the convenience of the parties, and so forth, which render it better that when an arbitration is necessary it should be essentially a private business. Indeed, the idea of a State Law Court is that it should only be resorted to when private methods of settling a difference are found unavailing. Arbitration is essentially a private method. Hence we have no doubt that as arbitrations can always be arranged and carried out by private persons, it is better for the State not to mix itself up with them, but to do its utmost to improve its legal and judicial system, so that when the private settlement of a dispute is impossible it may be adjusted in a law court with as much cheapness and expedition as possible. It is the great fault of the judges of the present day that they have not sufficiently attempted to make the higher tribunals of our country fit for the trial of disputes in a businesslike manner, and it is rather in this direction than by attempting to make arbitration a part of the legal machinery that real progress is needed.

It is desirable, however, that no one should be under the delusion that an arbitration is necessarily cheaper than an ordinary litigation. No experienced professional man, be he architect or engineer, can afford the time for an arbitration, or will take the responsibility of it, without handsome remuneration. Therefore the tribunal has to be well paid, whereas the State pays the judge. Again, in most arbitrations where technical questions arise, expensive evidence has to be obtained; here, again, is another cause of cost. So that, if a person wishes to avoid expense, he will settle a dispute, if possible, without the intervention of a third party. No litigation in any form can be cheap, nor is it ever likely to be so, and therefore it is best at once that, so far as the mere cost goes, there should be no misunderstanding as to the costs of an arbitration and those of an ordinary lawsuit.

There can, however, be no doubt that there is some expectation and desire to see the State, in some way, bring about arbitration and conciliation in trade disputes. The State has, however, plenty to do without taking this duty on its shoulders, and, moreover, it can be equally well done without



State interference. Unless the State can actually compel bodies, such as masters and men in a particular trade, to submit their disputes to arbitration, and can also compel them after a decision has been given to abide by it, State interference is absolutely useless. But it is clear that the State has no power, and is not likely to be given a power, to oblige any body of men to do this. The example of the Board of Arbitration and Conciliation for the North of England Iron Trade shows clearly that trade disputes can be adjusted without the interference of the State. That body was formed in 1869, and it has worked with the utmost success. Speaking at a recent meeting at Durham, Mr. Dale, the referee to the board, thus described its operations:—"The effect had been that instead of misunderstanding, bitterness, and the obscuring of questions by partisan statements, each party came to respect the feelings of the other, and the way was cleared for an impartial judgment on admitted facts. Each representative on the board was fully authorised to act for the works that elected him, and the decision of a majority of the board or its referee was binding on the employers and the operatives of all works that had joined the board. All questions were, in the first instance, referred to the standing committee to investigate and to endeavour to effect a settlement, but that committee had no power to make an award. In the event of the committee being unable to settle the question it was referred to the board as soon as possible. In the case of an equality of voting on the board an independent referee was appointed whose decision was final." That is to say, this body first of all endeavours to act as a "conciliator," and if it fails in that duty it becomes an "arbitrator." Obviously many trade disputes would never result in an obstinate and bitter conflict if conciliation could be resorted to at the very beginning of the movement. So that even if such a board as this were not always successful as an arbitrator, it cannot for a moment be doubted that it has saved disputes from growing by an early conciliation. It is quite certain, too, that private boards of this character must be more apt for the early stages of a trade dispute than any State tribunal. Nor do we see how, in practice, anything but the force of public opinion and the self-interest of capitalists and labourers can bring about the creation of boards of conciliation and arbitration to any large or general extent; nor, again, is it likely that outsiders, except by creating a public opinion, can do much good in the matter. In these days masters and men know their own business, but are still amenable to the force of public opinion, if that force is formidable and clear. The aim, therefore, of all reasonable men should be to endeavour to create a public opinion strongly in favour of the creation of such boards as we have indicated for the settlement of trade disputes. They have been shown to be both practicable and useful, and it follows that when strikes and lock-outs occur as a means of settling labour disputes, they should be regarded as being an outrage against reason and good sense, and as being as injurious to the commonwealth as murders and robberies. Every strike is the cause of great suffering and great loss, not only to those who are directly concerned in a strike, but to those who are affected by it indirectly. Hence the proper mode of ending a trade dispute when it arises is to refer it to a board of conciliation and arbitration. We have no doubt that, terrible as has been the misery caused by the coal strike of 1893, it has yet done good by deeply engraving in the public mind the necessity of such boards as we have here touched on. They must be extended from the north of England all over the country, and they must embrace not only the iron trade but every other trade. If within the next few years such a system of conciliation and arbitration can become general we may not unreasonably hope that with this century ends the era of bitter trade disputes.

There is undoubtedly at the present day a general consensus of opinion all over the Western World that war between nations should not be resorted to except as a last resort. A century ago this opinion had not grown up; it is not hopeless, therefore, to suppose that a similar opinion may be produced in regard to social wars in the nature of strikes. The natures of men do not change, but they may be modified, and though we may not expect to see arbitration and conciliation at all times and on all occasions take the place of strikes, there is fair reason to suppose that strikes may become very exceptional. There is ample opening for all trade and professional associations to press home the lesson of the recent coal strike, and to endeavour to establish boards of conciliation and arbitration. In no trades are the opportunities greater than in those which are concerned with the erection of buildings.

#### GREEK VASE-PAINTINGS.

THE splendid folio volume brought out under this title by Mr. MacColl and Miss Harrison\* brings together some of the most characteristic examples of Greek vase-painting designs, and ought to be of considerable value to students of Greek work. It enables those who cannot collect Greek vases (and few can do so—their natural habitat is a public museum) to have before them in a compact form the outline designs of a considerable number of representative vase-paintings. It is true that we do not get the colour effect of the work; to have attempted that, in spite of the simplicity of the colour scheme in most cases, would have rendered the volume too expensive for any but a very small class of wealthy purchasers. But the colours are so simple that they can be described, and the main interest of the designs can be sufficiently shown in line.

We presume that Miss Harrison, who has made the subject of Greek vase-painting her own, is the chief editor. Mr. MacColl's rather pretentious and affectingly-written preface does not add very much to the value of the volume. Miss Harrison contributes an introductory historical note, not dealing with the whole subject, but only with the examples depicted in the illustrations; and she, we presume, furnishes also the brief description of the subject and characters represented, which is appended to each plate. The plates are large ones, executed mainly in black and white, and reproduced from drawings made from the originals, so as to show the designs projected on a flat plane. It is one of the difficulties of accurate representation of this class of work, not generally recognised, that nearly all the designs are executed originally on the curved surfaces of the vases. Photography therefore can only be partially successful in conveying them, as the figures are necessarily distorted by being photographed from the curved surfaces of the vases on to a flat plane.

Miss Harrison briefly describes in her historical note the distinction between the two main classes of vases, the black-figured and the red-figured. The distinction is more than the mere difference of colour in the figures; it represents an important difference in the principle of execution. In the black-figured vases the figures are painted in black on the ground colour of the vase, a warm terra-cotta. In the red-figured vases, which come later, the figures themselves represent the colour of the ground, and the black is filled in between them. It is obvious that this makes an immense difference in regard to freedom of execution. A third method is that employed in Lekythoi or funeral vases. These are a creamy white, with the neck and vase black, and figures in colour painted on the intermediate portion. In all three it

appears that outlines were drawn first in the clay; in the Lekythoi the outlines of the figures were thus drawn and the coloured drapery put on over them; in some cases the drapery design has faded and the figures appear as if nude, though not intended originally to appear so, at least in the case of the female figures; an instance of this is given in Plate XLIII.

The names of many of the artists of the vase-paintings are quite familiar from their signatures, and Miss Harrison in her historical sketch is able to go into the style and special peculiarities of many of these painters. For these we must refer the reader to the book; our interest is rather with the artistic character and value of the designs. From this point of view they are calculated to be disappointing to those who are accustomed to think of Greek art as that in which the finest design of the figure is to be found.

There are few if any well-drawn figures to be found here, though there is a great deal of spirited indication of life and movement.

The main artistic merit of the designs consists in the sense of decorative effect with which they are treated; the manner in which the design is made to fill and adorn the space for which it is intended. This is especially the case in regard to the treatment of single figures; without appearing strained or awkward in attitude, they seem naturally to take the position which fills evenly the surface to be treated; or, where this cannot quite be done by the figure alone, realistic or symbolical accessories are added with very happy effect. This adaptation of the figure to the space is remarkably shown in the two subjects on Plate IX, "Satyr and Amphora" and "Satyr and Wine-skin," each of them single figures on a circular interior of a clyx. The figures, as far as the heads are concerned, are coarse and semi-grotesque in expression, but the limbs are better drawn than in many of the examples, and the manner in which legs, arms, and tail are disposed so as to fill the space, with the assistance of the amphora and wine-skin, is admirable; the lettering also is cleverly used to give a little incident where there would otherwise be a blank space. Plate XI, from a clyx in the Pinacothek at Munich, is a large and important design, of finer character of drawing than many of them. It represents the combat of Hercules with Geryon on one side of the circle; on the other side four youths driving away the cattle of Geryon. The cattle are grandly treated, in a semi-conventional sculptural style which recalls the horses of the Parthenon frieze; and the figure of Hercules, muffled in his lion-skin, is highly characteristic and full of vigour. On Plate XVI, the small illustration of a boy running after a hare is another example of the admirable manner in which the vase-artist conventionalised the action of the figure so as exactly to fill the space allotted to it. The figure here is not represented as running on a level line, which would have clashed with the circular form of the clyx; he is as if running on the interior line of circle, but the figure is so designed that this seems a natural action and quite satisfies the eye. A very remarkable design is that in Plate XVII, A, the interior portion of a clyx representing Achilles about to slay Troilus; the youthfulness of Troilus is indicated by the smaller scale of the figure, a very conventional resource, as Troilus, though young, was a grown man; but though the figures are not very well drawn, the furious action of Achilles, with one leg straight out and the other drawn back, and the sword raised over his head in the right-hand, is conveyed with most dramatic force. Another design in which violent action is powerfully rendered is that of Iris and Hera attacked by satyrs; two separate subjects, but on the same vase. The contrast between the treatment of the two subjects is characteristic and evidently intentional; the satyrs rush upon the minor goddess Iris, who is attempting, with violent action, to fly from them; in the other half of the subject Hera,

\* Greek Vase Paintings: a selection of examples, with preface, introduction and description by J. E. Harrison and D. S. MacColl. London: T. Fisher Unwin, 1894.



one whom stands the protecting figure of Hermes, assumes an attitude of indignant tempt, with one arm stretched out, and satyrs seem half afraid of approaching her; Hercules, who attends behind Iliad, bows his bow at them; he is clothed, fully enough, in Persian trousers, and looks sufficiently incongruous figure in comparison with the nude satyrs and the Greek elements of the goddesses. Whence this vulgar fancy of representing Hercules in attic dress? Was it to convey an idea of character as a traveller over foreign lands?

Among the curiosities of the collection is design (Plate XXXII.) which is a striking instance of modern incident with antique suggestion—a satyr swinging a maiden; a girl sits in a swing with a wooden seat, her feet pointed straight out before her; has just received a push from behind from another figure, and flies forward in the swing with her drapery streaming backwards (the wind); the ends of the scene are filled up with conventional foliage ornament the so-called honeysuckle pattern.

While this collection of plates is full of interest in regard to the characters and incidents portrayed, it is not in the main calculated to raise one's idea of everyday Greek art, except, as before observed, in regard to the skilful arrangement of the figures in a decorative sense, and the really wonderful expression of action in some few of the designs. In general, we are disposed to think that the artistic power of these vase-signs has been a good deal over-rated; that they were the work of popular artists catering for the general public and not possessed of any great learning in draughtsmanship. It is, perhaps, a different thing to contemplate the designs by themselves, apart from the vases which they served to decorate. On the vases they are regarded as making a whole with these; the shape of the vase is nearly always fine, the figure groups add materially to its decorative effect, and the fact of their being drawn on curved surfaces somewhat hides and carries off any lapses of drawing in the figures. We attach the designs from their proper position, and consider them apart, and they afford room for a great deal of criticism, and hardly justify in most instances all the enthusiasm with which they are sometimes spoken of, or come up to the level which we are accustomed to think of as that of Greek art. In fact, they may be said to have been, in general, trade or handicraft productions rather than the work of artists in the higher sense.

The book is beautifully printed and got up; why the cover was disfigured with such absurd and eccentric design—what is its meaning or what its possible relation to the subject of the book—we cannot imagine.

#### NOTES.

THE third report of the "Society for the Protection of the Monuments of Ancient Egypt" gives some interesting and satisfactory information as to the steps which have been taken to arrest the decay of the invaluable remains of Karnak. The mischief done to Karnak has arisen mainly from the movement of the inundation water through the ruins, and the consequent alternate exposure to periodical wetting and drying of the bases of the walls and columns, which has gone on for centuries, and has brought down many of the columns. It is now proposed to fix a small pumping-engine in an inconspicuous position outside the ruins, to pump out and run off any water that finds its way in. This would involve an annual expenditure of about 200*l.*, and the Society have undertaken to provide for this for two years and to supply the engine and start the work, on condition that the expenses thereafter should be provided by the Egyptian Government. This, we gather from the Report, has now been arranged,

and the most magnificent group of ruins in the world will, thanks to the action of the Society, be saved from further decay. In regard to the rock temple at Abu Simbel (the one faced by the four celebrated colossal statues), which was reported two years ago to be in imminent danger through the loosening and moving forward of the ledge of rock overhanging the left hand statue, it was stated by Sir Colin Moncrieff that 1,000*l.* would be required to put the temple in a state of security, and the Society were prepared to contribute 250*l.* towards the work; but we are glad to learn that the Egyptian Government has taken the matter in hand at its own cost. The most important point of all in the report is in regard to what is rightly called "the preposterous scheme" of forming a lake or reservoir at Philæ, and submerging the island and temples. It was hoped that this had been abandoned; but it now appears that M. Garstin, who has succeeded Sir Colin Moncrieff as Under Secretary of Public Works at Cairo, is in favour of it, and that the engineer who proposes the scheme boasts that the work will be "the biggest thing in dams" ever known; in fact, that these two gentlemen are utterly indifferent to the value and interest of the Philæ temples, and seem to imagine that all objections can be met by the undertaking to take down the temples and re-erect them elsewhere! Argument is obviously thrown away upon such barbarous stupidity as this. The subject was to have special consideration at the meeting of the Society for the Preservation of Monuments of Ancient Egypt announced for Friday afternoon of this week. Such a scheme is almost past speaking of; it shows painfully what engineers are capable of in the way of vandalism.

ON Tuesday Mr. Gladstone moved to discharge the order for the Employers' Liability Bill—in other words, he moved that the Bill be dropped. This measure is, therefore, now dead. It is killed for the present by party spirit. As we have over and over again pointed out, the Bill with the contracting-out clause was an advance on previous legislation, and even if the Government had not liked that clause they should, in the interest of the working classes, have passed the Bill into law. As the Bill stood it abolished the doctrine of common employment. To cut off your nose to spite your face, to use a homely saying, is not statesmanship, and that is what the Government have done. They have preferred to have no bread if they could not have the whole loaf, and the blame for the delay in the passing of the measure rests solely on the Government. It is clear that in no long time the measure must again be introduced, but, meanwhile, a great deal of time has been wasted by the deliberate action of the Government.

ALTHOUGH the controversy of last year over the vexed question of railway rates was afterwards overshadowed by the dispute in the coal trade, the former subject has by no means dropped out of sight, and the report of the Select Committee is regarded by the companies with alarm. That they have failed to deal satisfactorily with other subjects of contention was shown by the report of the Select Committee, for the consideration of which the Mansion House Association on Railway and Canal Traffic convened a meeting last Monday. Various general questions arising out of the report—which Sir James Whitehead characterised as miserably inadequate—were discussed, and some strong resolutions adopted. The gathering was very representative, members of both Houses of Parliament taking part in the proceedings. The important question of rebates to siding owners was also the subject of a conference at the Board of Trade the following day, when a deputation from the Mansion

House Association laid their views upon this subject before Mr. Mundella. The injustice under which those who provide their own terminal accommodation still suffer, was explained by speakers from all parts of the United Kingdom, and Mr. Mundella expressed himself unable to understand why a person who relieves a railway company from the performance of service terminals, and who provides his own sidings, should be charged the same rates as one who requires the company to do all the incidental work and provide all the necessary accommodation. Yet so it is, and the siding owners—whether as individuals or as corporate bodies—have hitherto failed in their endeavours to obtain an adequate recompense for their outlay. The explanation is probably to be found in the clause in the Act of 1888 which enables the companies to pile up charges for "exceptional services" as a set-off against the rebates they ought to allow. Mr. Mundella impressed upon the deputation his desire to deal fairly and impartially with the question, and as the report of the Select Committee will doubtless be followed by fresh legislative proposals, the whole subject is likely to be again before Parliament at an early date.

THE draining of Lake Copais has led to discoveries far beyond what was at first anticipated. Not only has an elaborate system of aqueducts been laid bare, of which we hope later to give full particulars, but in the bed of the lake traces of an ancient settlement have been found, and according to the *Berliner Philologische Wochenschrift* (1893, 29) the ground plan of a palace has been made out, which in main outline corresponds to that of Tiryns. Thus it seems that the myth of the flooding of the plain by Herakles corresponded to some actual fact. From the bed of the lake we may hope to recover traces of that ancient civilisation to which we attach the name of the hitherto fabulous Minyæ. To this race belonged the Argonauts, and, if recent theory be correct, the women hosts of the Amazons. This buried city has been kept intact from the chance marauder by the waters of the lake; we may therefore reasonably hope it will yield a rich treasure to the scientific explorer.

WE have so often and strongly urged the publication of the monuments in private collections that we gladly draw attention to the fact that the sculptures of the well-known Barocco collection are now available to the archaeologist and art student in a work published by Brückmann, of Munich, with explanatory text by the owner, Giovanni Barocco and Dr. Helbig. The first three instalments are before us and the rest are to follow at short intervals. The collection is second in importance, perhaps, only to one acquired in recent years—*i.e.*, the Sabouroff collection, now divided between the museums of Berlin and St. Petersburg. It is not confined to Greek work, but contains specimens also of Egyptian, Assyrian, and Cypriot sculpture; in no case has the owner permitted restoration. Archaic and transitional art is well represented, notably by the grave relief representing a horseman, something in the style of the well-known "Stele of Ariston," also a Hermes Kriophoros, and, for transitional work, the best extant copy of the Marsyas of Myron.

THE collection of drawings by Mr. Harry Furniss, at the Gallery of the Fine Art Society, affords a remarkable example of power both of draughtsmanship and of satire; the latter not always in the best taste. One of the most notable points in Mr. Furniss's work is his power of seizing the peculiarities of certain styles of drawing and turning them to account. It was almost immediately after the exhibition of Japanese paintings in the White Gallery at the British Museum, that Mr. Furniss suddenly became Japanese, and in the series of grotesque studies signed by "Lika Joko" gave the



most wonderfully clever reproduction of the characteristics of Japanese figure-drawing applied to the caricature of modern scenes and persons. The same kind of talent is shown in the clever representation of members of the House of Commons in the style of fretwork delineation—"The Happy Family, by our Artist in Fretwork" (55)—in which personal characteristics are so admirably rendered while retaining the character of fretwork. The illustrations to "Sylvie and Bruno," and what we may call the "serious studies" of some members of Parliament, show that Mr. Furniss can when he likes do charming work without going into the field of caricature. Some of the satirical sketches are in very bad taste: "Mr. Gladstone Scratching his Head," for instance; a kind of thing which we call absolutely ungentlemanly; but of course one cannot be surprised at this in the case of an artist who could take the occasion of the opening of the Imperial Institute to produce, in one of the papers to which he contributes, a grotesque sketch of "Her Majesty the Queen" leaning on a stick to walk up the hall. It might have been thought that an aged lady, occupying the first position in the land, and whose conduct in that position has earned her the respect of the whole nation, was hardly a fitting subject for a caricature, especially one turning partly on the infirmities of age; but "Lika Joko" apparently thinks more of his joke than of considerations of good taste or good feeling.

IN a letter in the *Times* of the 16th, Sir F. Bramwell stood forth as the champion of the two-gallon flushing cistern and economy in water-supply. Sir F. Bramwell is an eminent engineer; we are not aware that he is an authority on sanitary subjects, and one would like to know what are the motives which induce him to be so much in earnest in preaching false economy in the use of water in London. At all events, we hope Sir F. Bramwell was satisfied with the string of answers he got in last Tuesday's *Times* from people who are a good deal more competent in such matters than himself. It is really monstrous that in a great capital like this an architect should be unable to specify for a London house the best water-closet apparatus that he could get, because a law made in the interests of the water companies will not allow him water enough to work it properly; that an eminent engineer should write to the *Times* to try to urge the continuance of this state of things; and that the *Times* should give special prominence to such a letter by printing it in the largest type. However, we imagine that both the editor of the *Times* and Sir F. Bramwell know better, after perusing the string of letters printed in the *Times* issue of the 20th. One correspondent, we observe, pointedly asks Sir F. Bramwell "in whose interest his letter was written;" a not unnatural question under the circumstances.

WE have been invited by the Victoria Safety Appliances Company to examine and test a new window-cleaning guard that has recently been invented and patented by Mr. L. Anidjah. The apparatus is composed of a light wrought-iron and wire frame, consisting of two wrought-iron uprights and a cross bar at the top on the inside, and a small platform resting on the sill with a railing, either 33 in. or 2½ in. high, enclosing it on three sides. The top rail of this enclosure is continuous, and is brought down at a sharp angle to a point about 6 in. above the level of platform, so as to allow the sashes to slide freely; it is then twisted round the inside vertical bars, and projected so as to make, with the end of the top inside bar, four stops against the inside of the window-frame. Given a building with a large number of windows of exactly the same size, we consider this apparatus might be advantageously used; but this does not often occur, and the consequences of the careless fixing

of a guard made, say, for a 27-in. opening and used at a 33-in. opening, are not pleasant to contemplate. It is the more important to draw attention to this, as we see that the daily papers, which in such matters say just what is told them, are recommending this as giving entire security (see the *Pall Mall Gazette* of Thursday). If the guard is properly fixed, no doubt it is a valuable safeguard, but, insecurely fixed, it might give rise to misplaced confidence; and we confess to a somewhat low opinion of the average intelligence of the domestic servant. This guard is apparently only adapted for windows with sliding sashes. There seems to be little doubt that the reversible sashes that have been constantly introduced, but little used, are the only safe method of cleaning sliding sashes any height from the ground, and it is to be regretted that cost should prevent their more general introduction.

IN the Twenty-seventh Annual Report of the "Artisans', Labourers', and General Dwellings Company," reference is made to the disadvantages under which the Noel Park Estate at Wood Green has been placed owing to the delay on the part of the Great Eastern Railway Company in providing on this branch those facilities for the cheap travelling of the working classes which exist on other parts of their suburban system; and the hope is expressed that additional cheap trains will be run as soon as the widening of the railway and the extensions at Liverpool-street terminus are completed. We hope it will be so. The provision of cheap and healthy house accommodation for the working classes is intimately bound up with the question of cheap railway travelling, and in the long run it is probably to the interests of the railway companies themselves to furnish such facilities of transit. We learn from the Report that 1,295 houses and shops are now in occupation on the estate referred to.

ON June 16, 1883, we published a view of the Old Palace, at Richmond, as reinstated for Colonel R. T. Thompson, under the superintendence of Mr. H. O. Cresswell. In our description of the works we referred to the Royal Palace of Sheen, and to the circumstance that—contrary to popular belief—no remains of the royal apartments, which stood along the river-side, now exist. But it is to the grounds which appertained thereto that public attention is just now directed. A local movement has been started to secure them as an open space for sports and out-door exercises, as well as for Yeomanry and Volunteer camps. The Old Park, as it is called, in contradistinction from the southern and much larger New Park of Charles I., lies between Richmond Green and Kew Gardens, from the latter of which it was separated by a lane until the building of George III.'s new palace of Kew, after James Wyatt's designs. The Old Park was laid out in avenues by Bridgman; but his formal plans were afterwards modified by "Capability" Brown. Near the site of the lodge, built in 1707 for James, Duke of Ormonde, was erected in 1769, an Observatory, from the designs of Sir William Chambers, who was employed to lay out the gardens of the old Kew Palace, and built the pagoda, the mosque, the several temples, the menagerie, and so on, as he has himself described. On part of the site of Richmond Palace Sir Robert Taylor, architect, built a house for Sir Charles Assgill, Bart.; another plot was taken for a house built by George, third Earl of Cholmondeley, subsequently occupied by William, fourth Duke of Queensberry. After the death therein of his consort, Richard II., in characteristic chagrin, abandoned the old palace at Sheen, which had been a home of our Plantagenet Kings from Edward I.'s day; his successor, Henry, of Lancaster, restored the dilapidated buildings, and after their destruction by fire in 1499 Henry VII. rebuilt them, naming them Richmond, from his former earldom. Henry

VIII. bestowed the palace in dower upon his divorced wife, Anne of Cleves; its associations with the domestic histories of Wolsey, Edward VI., Elizabeth, Henry, Prince of Wales, and his brother Charles, we need not rehearse. Most of the apartments were dismantled during the Protectorate; but Charles II. occasionally stayed there, and Burnet tells us James II.'s son was born there. A painting—by Vinkeboom—of the Palace, with another, ascribed to a pupil of Rubens, of the old Lodge in the Park, were long preserved in the house of Lord Green, of Sir Matthew Decker, then George I.

WE referred some little time since to the circumstances attending the appointment of the Surveyor to the Surrey County Council, when the Council, after having advertised for a surveyor and received many applications those of two or three eminent surveyors, appointed the son of an outgoing surveyor, who had certainly made any public reputation. At a recent meeting Mr. Bidder, O.C., one of the members of the Council, moved a resolution to call attention to the matter, and to move "that it be referred to the General Purposes Committee to revise the standing orders relating to the appointment of County Officers." It appears that the appointment referred to was made by the casting vote of the chairman, and that the surveyor appointed was engaged to be married to a relative of it. Of course the chairman indignantly said that he voted for the best man independent of any personal considerations; we know that chairman always do on such occasions. But we find his virtuous indignation will not prevent people from drawing their own conclusions from the fact that the Surrey County Council advertised for candidates publicly, and received applications from some men of very high standing, and that they elected a man who was practically unknown, and who was the son of their late Surveyor, and a relative of his, of his chairman, who got him the place by his casting vote. In other words, the Surrey County Council, which is responsible to its constituency, did not make the appointment in the public interest, and beguiled a number of surveyors into applying for a post which appears to have been practically disposed of beforehand. Mr. Bidder, of course, got nothing but abuse for his motion; that is also in the usual order of things in such cases.

WE observe that at the next meeting of the Institute of Architects papers on the new laboratories at University College are to be read by several Professors of that institution. These will no doubt be of value in a technical sense; but we hope that the learned Professors will not be allowed to depart without hearing some expression of opinion as to the manner in which they have architecturally treated the building up to their charge.

ARBITRATOR'S AWARD.—Mr. J. Wolfe Barry, Westminster, has issued his award in the case of *Holme and King v. Teddington Local Board*, which was heard at the Surveyors' Institution during the long period. Claimants, a firm of contractors claimed 13,600*l.*, in consequence of being prevented from carrying out the sewerage of Teddington according to contract. The Board counter-claimed for 5,000*l.*, paid to another firm, who completed the works. The award was given for claimants to the amount of 10,720*l.* and costs, and the counter-claim was dismissed.

BUILDERS' EXCHANGE, HULL.—On the 15th inst. the members of the Hull Master Builders' Association, which includes every branch of the building trade, met on the occasion of the opening of the Builders' Exchange for Hull. The exchange is situated in Posterngate, and is composed of a suite of rooms forming the upper portion of the old Savings Bank premises. The President, Mr. Council Skinner, in declaring the Exchange open, congratulated the members on the consummation of an enterprise that had been fostered by many for years past. He now that a Builders' Exchange had become an accomplished fact, he felt sure that the members would find the accommodation provided for them a great convenience when transacting business in old town.



THE ADVANCEMENT OF  
ARCHITECTURE.AL ACADEMY LECTURES BY PROFESSOR  
AITCHISON, A.R.A.—LECTURE IV.

is now time to say something about the  
ional or æsthetic side of architecture. I must,  
ver, preface the subject with a few remarks.  
l the material advancements made by man  
omewhat like those made on a coral reef by  
ssive generations of coral insects. Each gene-  
n builds its cells on those of its immediate  
ecessors, only it builds more, so that the  
gradually spreads out from its foundation,  
though the whole reef has been the work of  
ssive millions of insects, yet the last range  
lls probably differs but little from the first.

ere is, however, this difference between  
s progress and that of the reef, that in man's  
e have been epochs of discovery and inven-  
so that his later progress has little resem-  
e to his first beginnings. Man's progress  
widens from the bottom, but during the  
ress he has discovered some of the laws of  
e, and has forced those laws to aid him in a  
e that would have been thought magical or  
culous a few centuries ago. Queen Elizabeth  
in 1603, and she would certainly think she  
bewitched if she could be brought to see  
ons travelling on land at the rate of sixty  
s an hour, ships immensely larger than any  
new going without oars or sails at twenty  
s an hour, messages sent in a few minutes  
s the Antipodes to London, streets and houses  
ly lightning, and hear the speeches she had  
spoken repeated in her own voice by  
inery, and she herself photographed in a  
late.

ere is something else, too, that may be said  
at material progress, when discoveries have  
made in natural philosophy, and these  
coveries have been applied to manufacture on  
arge scale; the mere extension sometimes  
out a new vista of progress. Theodorus of  
nos discovered how to use cast-iron and to  
e statues of it, but it was only when cast-iron  
ame largely used that Smeaton could apply it  
achinery, and it is now, when turned by the  
semer process into steel, applied in such vast  
se to marine engines that Theodorus himself  
ld doubt if it were the same material.

hosphorus was discovered in 1669, but it was  
till chlorine was wanted for bleaching and  
mal charcoal was largely used that phosphorus  
ld be obtained cheaply and in large quantities.  
osphorus was then used for matches, and  
tems of boxes of these are now made, and  
h box is sold for the fraction of a penny. The  
e with which a light can now be got makes an  
ch, for in the days of my childhood a light  
ld only be got by a long and laborious process  
a flint and steel, and by the aid of a tinder  
e and brimstone matches. These matches  
all the days of Martial, who twits an acquaint-  
e with his trade from hearing him bawl in the  
k streets "for broken glass, who'll matches  
e?"

he fine arts, however, cannot be improved in  
way, for when once the mechanical difficul-  
ties have been overcome, the work in them  
ely requires special capacity, keen observation,  
er feeling, great industry, and a sympathetic  
eration to be charmed by them. The earliest  
ems and plays that have come down to us are  
only as good, but in most respects better than  
can do now.

language must, of course, have been brought up  
a high pitch of excellence before it was fit to  
ress deep or thrilling emotions. Milton, whose  
orksmanship has never been surpassed, asks  
s of the hearing of the plays of Æschylus,  
hacles, and Euripides, and the poems of  
e, as one of the noblest delights of the  
ughtful.

"Sometimes let gorgeous tragedy  
In s. p. d. p. d. come sweeping by,  
Presenting Thebes, or Pelops' line,  
Or the tale of Troy divine."  
(Milton) "Il Penseroso."

Though we must not forget Browning's dictum,  
at the thoughts and feelings of the present day  
ld not be expressed in the language of the  
eek dramatists, I was bound to say this,  
e the Greeks could not have built a Gothic  
thedral till the arch was invented, much less  
ld they have built the Crystal Palace till glass  
d iron were common materials. With this  
viso I may say that the Greek temple has  
herto been unsurpassed; its main structure has  
unspeakable advantage of having nothing but  
purely necessary, but every refinement of art  
s lavished on it, and advantage was taken of

the qualities of the atmosphere and the power of  
the sunshine. The vulgar argument is this, that  
we who "Rift the hills, and roll the waters, flash  
the lightning, weigh the sun," should, therefore,  
write, speak, carve, paint, and build better than  
the people of any age that went before us. The  
fact that we have a wonderful daily press, the  
steam-engine, the telegraph, the phonograph, the  
electric light, and that we have some insight into  
Nature, has no influence whatever in making us  
carve better than Phidias, paint better than  
Titian, draw better than Michelangelo, or build  
more sublimely than Ictinus.

All I want to show is, that our expression  
should be different from the past, that we should  
be able to give our own artistic expression to our  
own buildings, so that they will show our own  
generation that we are different from Greeks,  
Romans, Byzantines, Saracens, and Mediaevals,  
and will enable future antiquarians to judge what  
we were from our architectural works. We are  
not stupid, nor lazy, nor worthless. We certainly  
have some cultivation, some refinement, and  
some aspirations, that did not belong to the most  
refined, cultivated, and aspiring of the nations  
who preceded us. We may not have much in-  
vention, but surely for a whole nation to be abso-  
lutely devoid of invention, is to say it is not  
human. I sincerely believe that the reason of our  
failure, and I may say the failure of all Christen-  
dom, is merely owing to our having deserted the  
proper method of using our studies.

Some ancient philosopher said, there are two  
things we should never complain of, "Those  
things which we can help, and those that we  
cannot." Let us then admit that we have just  
sufficient invention to prevent us from being  
ranked with the beasts that perish, and that  
every surrounding is the most adverse to progress  
in architecture, yet these misfortunes should not  
prevent us from trying to improve. We English  
are very like the Romans, and may be said to  
have taken their motto—

"But thou, secure of soul, unbent with woes,  
The more thy fate afflicts, the more oppose."  
Virgil.

Sir Joshua Reynolds says:—"It is by being  
conversant with the inventions of others that we  
learn to invent," and though I fear it is not true,  
for I believe invention to be a native gift of the  
mind, yet in the fine arts invention is of little  
use, unless you know how it has been treated by  
former inventors, and how it has been approved  
by posterity. The object in the fine arts is to  
create admiration by the calling up of some  
emotion. Now, though mankind are different at  
different epochs, they are not so absolutely unlike  
that we can form no idea of how a thing will  
affect them. We can learn roughly how old  
inventions have been received by contemporaries,  
and how their verdict has been confirmed or  
ignored by posterity, and judge of our own in-  
ventions accordingly.

At certain epochs monstrosity and contortion  
have been passionately admired, but this inven-  
tion has not been approved of by posterity; while  
the Greek inventions, which no doubt were  
equally admired at the time, have excited the  
admiration and received the praises of mankind  
from that day to this; as we may see in the  
writers from Plutarch to Renan.

I do not think we paraphrase the past master-  
pieces of architecture enough—I mean for the  
purpose of instructing ourselves, and not for use.  
Science is constantly advancing, the knowledge  
of the exact strength and the proper disposition  
of materials is progressing, too, not to speak of  
the discovery and invention of new materials.  
And one of the important branches of archi-  
tectural skill is to know how to clothe them in  
forms that are both appropriate to the material  
and produce the effect we want. We know, for  
instance, that columns or piers may be built of  
hard stone, thirty diameters high, to bear con-  
siderable weight; not to speak of cast-iron  
columns. If we are to make columns or piers  
of such proportions answer our purpose we must  
have learnt the art of proportioning and profiling,  
and to some extent our compasses must be in  
our eye, for we must have learnt the elements of  
both, though from very different models. Every  
architect knows that even in present practice new  
problems of shaping, proportioning, and profiling  
are constantly occurring, and these will probably  
be more numerous and more difficult in the future.

The science of acoustics, for instance, as applied  
to buildings is at present in a very rudimentary  
state. If this science were to progress rapidly  
we might be called upon to give an architectural  
appearance to rooms and halls of an entirely  
novel shape. Hitherto what has been most  
effective in one climate, has been supposed to be

equally effective in every other, although, if we  
have travelled, we know it is not; colonnades,  
porticoes, and peristyles are not only delightful as  
shelters from the sun in hot and sunny climates, but  
are most effective as architectural compositions.  
Speaking roughly, you have a succession of light  
streaks against a mass of deep shadow, but in this  
sunless and misty climate such arrangements are  
not wanted and are ineffective. In very misty  
days the columns and background together only  
form one slightly variegated mass.

The general arrangement of a Greek temple  
was beautifully adapted to the Greek climate,  
and naturally, for it was but an enlarged  
house: while, besides its proportions, every  
part had been profoundly studied in re-  
lation to the sunshine and atmosphere. What  
is more beautiful than a Doric column in Athens?  
And what, when there is no sun, is duller and  
more ineffective here? For every Greek moulding  
was studied to perfection for the sunshine. The  
Gothic architects made the same attempt as the  
Greeks, only for misty climates, and although they  
were much less refined in their taste, and took  
infinitely less trouble, they roughly got the effect  
they wanted. Students are sometimes taught to  
observe the subtle proportions and elegant contours  
of Greek mouldings, but they are rarely shown  
Greek mouldings full size in a perfectly polished  
material on a brilliantly sunny day, or by a  
single strong artificial light. Are they ever told  
what the Greek architect wanted to express? And  
shown how it was obtained? And also informed  
that, if used externally and in stone here, the  
mouldings would be perfectly ineffective for three  
quarters of the year, and never have the fineness,  
delicacy, and reflexions of marble. The meaning  
and use of Gothic mouldings are, I believe, equally  
untaught, but the student is disgraced if he does  
not know to what century they belong; as if the  
business of the architect were to reproduce old  
work, so as to keep up the point of Lord Byron's  
sneer, when he calls him "Bricklayer of Babel,  
called an architect."

We cannot study Greek work too deeply to  
refine our perceptions, to see how common things  
can be shaped into beauty, to learn to love  
simplicity, to learn how to take the same endless  
pains the Greeks took in adapting our buildings,  
and every part of them, to this climate, to learn due  
proportioning, which gives undying beauty, and  
to see that each part is proportioned, not only to  
harmonise with every other part, but also to  
secure the due proportioning of the whole. The  
Gothic architects, like Vitruvius, and probably  
from him, took the human figure as their scale;  
when we have thoroughly studied Greek work we  
should then try and apply the lessons learnt, even  
if we only try to make a cast-iron girder and a  
stanchion as beautiful as a Greek architect would  
have made them. I do not even object to direct  
appropriation of a piece, for, if we can use it  
properly, it becomes a quotation. The poets have  
no qualms of conscience in this respect. Keats's  
"A thing of beauty is a joy for ever," is from  
Euripides, and almost every great poet borrows  
from the antique, and from his predecessors. We  
are, however, not Greeks of the fifth century, B.C.,  
and cannot have their identical tastes and desires.  
We could not be Greeks if we would, and I  
would not be a Greek if I could, supposing De  
Quincy's verdict be true—that they were a nation  
of swindlers. The Greeks were pre-eminently  
artists, and from them the civilisation of Christen-  
dom has come. The Romans, on the contrary,  
were not only inartistic, but almost to the last  
decided, if they did not despise, all the fine arts  
but eloquence and poetry. In other respects they  
were a greater people than the Greeks. They  
were a hard-headed, practical, straightforward,  
honest people, who knew how to obey as well as  
to command, until they were corrupted by power,  
wealth, and luxury. They had, too, a natural  
gift for construction, which the remains of their  
buildings in every part of the world amply show.  
Directly they became acquainted with Greek  
architecture they not only felt they were in the  
presence of their masters in æsthetics, but saw no  
better way of rivalling them in architecture than  
by taking their work bodily. You must remember  
that the living Greek architecture of Roman days  
was not that of the time of Pericles and Phidias,  
but the debased architecture of the Macedonian  
barbarians and of Sicily. The Romans are  
supposed to have got the arch from the Etruscans  
at an early period of their history, and they were  
much too practical a people to overlook so useful  
and economical an invention; it was a new  
advance in statics, and did not æsthetically  
harmonise with the Greek post and lintel. To  
the Romans the post and lintel was art, so they  
used it where they could for temples and for their



grand public buildings, while for all practical work the arch was used; the column and pilaster being looked upon as signs of art, whether they were wanted or not. The Romans tried to amalgamate these two methods of building as much as possible. No better illustration of this can be offered than their triumphal arches. At some period after Vitruvius's book was written, the Roman method of building with rubble, faced with triangular bricks, was introduced, as well as the making of a light framework, with rectangular bricks, for the rubble of arches, vaults, and domes, so that there was no sort of building the Romans could not execute. Their requirements were such, that much more elaborate plans were wanted than those we find in Greek remains, and their buildings were of much greater altitude. The Greek public buildings being mostly of one story, or, if of more, the stories were comprised in the height of the one external order. To attain altitude, the Romans piled a series of buildings, one on the other, each making a story, and each story having a complete order of columns or pilasters and their entablature, but with arched openings between the columns. The column, except for porticoes and peristyles and for decorative purposes, gradually became confined to one use, *i.e.*, to support groined vaults, but, as if to show its former use, they left a slice of entablature over it, until the days of Diocletian (284-305 A.D.), when the slice was left out, and arches sprang direct from the capitals of the columns; so that we may say that Roman architecture, as a style, was the struggle between the arch and the lintel as to which would get the mastery, and it was not until Byzantine days that the arch finally got the upper hand.

Since Roman architecture has not only been the study of the architects of every country in Christendom, but was looked on as the summit of perfection until the Greek and Gothic revivals, it cannot properly be dismissed with a trifling notice. From the end of the fourteenth century till nearly the end of the eighteenth it was the sole architecture employed in the most civilised parts of Europe. The paraphrases of it by the antiquarians, sculptors, and painters of Italy have been the admiration of all Christendom almost to the present day. It must be confessed, too, that in looking round any exhibition of modern architectural drawings, either of designs or buildings, that those alone that are Classical attract our attention by their superior style and elegance. In spite of all these considerations I think we should be wrong to adhere to it, for with it we cannot express what we should now express. Dante was blamed by the scholars of his day for not writing his Divine Comedy in Latin, but he felt that he could not express his thoughts properly in a dead language, nor could he by so doing make the vulgar tongue classical; and, in my opinion, he very properly sacrificed stately diction and harmony to vigour, force, and popularity. It cannot now be doubted that the promptings of his genius were right, for instead of his poem being the monument of the middle ages, familiar to gentle and simple in Italy, and to most educated persons in Christendom, it would now be alone read by a handful of scholars, like the Latin poems of Politian.

Let us see to what use we can put Roman architecture as an æsthetic study, not for use, but to learn from. I think it may be said that the Romans rarely failed in getting dignity; it was, in fact, their aim, both in the fine arts and in their bearing and behaviour. It is said of Virgil's "Georgics," or, "The Guide to Husbandry," put into verse, that he flung about his shovelfuls of dung with grace and dignity. The Romans got this dignity in their buildings mainly by proportion. Every building was proportioned in such ratios of length, width, and height as experience had proved to produce a dignified effect. A part of the width was taken as a module or measure for every detail, and each part was proportioned by it to the whole and to every other part. This Vitruvius calls symmetry. Rooms were proportioned in the same way as buildings, and by rooms I mean every sort of single apartment for worship, state, or use, and of every shape and size. The rules for proportioning rooms may be as useful to us as they were to the Romans. These proportions may occasionally, however, require to be varied to meet different requirements and increased knowledge. Our light is feebler, and the cold greater than those of Italy, and the sun less powerful, our habits and customs are not the same, our knowledge of the quantity of air wanted, and the frequency of its change are different. Such rooms as are now called the wards of a fever hospital require an allowance of 2,000 cubic feet of air for each patient. We should not, however, forget that there are visual

proportions that must be correctly got if we want the room to please the eye, and the same is the case with structural parts. Our knowledge of the exact strength of materials is much greater than that of the Roman architects; it would, therefore, be ridiculous to use their proportions if it involved great waste of material. Take stone columns, for example: because we are more learned in this particular, we are not to make the columns ugly; we have to get agreeable proportions in our new ratios. Even Vitruvius, who mainly gave recipes, says something must be left to genius. I do not pretend to give recipes; all I advise is, that you should use your knowledge and your brains—perhaps even that much abused word *taste*.

No architecture that has ever existed is without useful lessons for architects, if they will only use it properly, and Roman architecture, like everything the Romans did, is full of lessons. We have, for example, never arrived at making blue glass equal in colour to that of the Romans; the best Medieval blue glass was made from Roman fragments mixed with white. England is only a minute fragment of the Roman Empire, and though the Romans got all they knew from the Greeks, all subsequent European, and the greater part of Asiatic architecture, of whatever style, was founded on Roman buildings or remains. Some was the best imitation of Roman or Byzantine work that savages could make, and the rest was done by vigorous people, more or less barbarous, until we come to the Italian Renaissance. It might seem more convenient to take the Italian Renaissance with Roman architecture, but it would only complicate matters, as whatever precedes, and is accessible, influences what follows, be that influence great or small. You must bear in mind that knowledge and skill presupposes a considerable amount of civilisation, but superior savages may have much grander views and nobler instincts than the civilised. This appears to me to be well shown in Romanesque. The Germans, Lombards, and Normans show this in their works. The Norman part of the interior of Durham Cathedral is one of the most impressive buildings in the world, and as the Normans progressed in architectural knowledge they got a certain sort of refinement without altogether losing their grand ideas. The Normans, too, were particularly fond of figure sculpture, and though their sculptures were very rude, they show the Norman likings and imagination. After these barbarians had passed through Europe and Asia Minor, and had seen the masterpieces of antiquity and of Byzantine, they came across the new architecture of the Saracens, and were greatly influenced by it. They became as well students of geometry. The Saracens had introduced geometry into Europe, and it was one of their favourite studies. Abeldar, who lived 1079-1124, is supposed to have been, to some extent at least, a Rationalist, and he was greatly run after, and his views adopted by the students of his day, and his philosophy greatly affected the people of the time; so that at the beginning of what we call Gothic, a large portion of the laymen found they could use their reason on building, without fear of the dungeon and the rack, or of being burnt alive. Byzantine architecture differed little from very bad Roman work in its details, and but little from late Roman work, but it adopted the dome on pendentives on a large scale, afterwards the dome on a drum, and eventually used small domes or drums as lanterns, to get light into dark aisles or corridors, and the design and carving of foliage, mostly of the Greek acanthus type, was beautiful and spirited. Domes on drums characterised Cathedrals down to the days of St. Paul's, or even of St. Isaac's, but in the West, from the eleventh to the sixteenth century, towers and lanterns were more common than domes.

I have chosen Saracenic as a style to contrast with Roman, and also to show how one new style at least was developed. The Saracens had architecture whatever when they emerged from Arabia. When Mahomet was about twenty-one their hypæthral temple at Mecca was washed down, and so little did the Arabs then know of building, that the leading tribe, the Koreish, was obliged to employ a Greek ship's captain to roof the Caaba. He was shipwrecked on the coast of Arabia, and said he was skilled in architecture! and the roofing was done with the timbers of his ship. After the Hegira in 622-23, the great mosque at Medina was built, but I believe mostly of palm trees, and when Mahomet died he was put in a brick vault, so the Arabs, Jews, Abyssinians, or Christians in Arabia knew how to turn a brick vault. There is very little accurately known about the dates of any of the buildings of the ancient world. Fergusson, I believe, was the only person

who believed that the Pantheon was not Agrippa's days, until the late discovery that it could not have been earlier than the days of Hadrian, and still less is known of the masterpieces of Mussulman architecture, so I have taken Mr. Stanley Lane Poole's dates of the Saracenic buildings in Egypt. The Mosque of Amru, somewhere about 650 A.D., was probably of wood and has been repeatedly burnt down, and the one we get in Egypt is that of Ahmed Ibn-Tulun, who reigned between 868-883, A.D.; his mosque was built of brick by a Koptic architect, the Koptics being the native Christians of Egypt. It pointed arches, slightly horse-shoed, with stalactites, and shows a strong Byzantine influence—in fact the original part has nothing distinctly Saracenic about it but its arrangement, although Fergusson takes it as the starting-point of Saracenic architecture. The domed part in the centre of the court-yard, which has, I believe, the first-known instance of stalactites, is of later date. Compare this with the Mosque of Sultan Hassan 1356, and that of Kait Bey 1472: at the time of first, the Saracens had practically extended their conquests to their utmost limits, while the Mosque of Sultan Hassan was built about seventy years after the Christians had been driven from Palestine. Before that we have the great mosque of Cordova, built by the order of Abd-al-Rahman, and on which he is said to have worked: I believe we have cusped and interlacing arches; the architecture is supposed to have been influenced by that of North India. Abd-al-Rahman was Caliph in Spain 755-787, so that he died nearly a century before Ahmed Ibn-Tulun.

Some critics consider the work done by Abd-al-Rahman and his immediate successors the best Saracenic work in Spain, and greater than the Alhambra; but it is like the preference of Romanesque to Gothic that entertains; the Romanesque may be more masculine and dignified, but it strikes no one as being so marvellous. The last phases of Moorish Gothic architecture appear, even to the initials as work done by magicians or spirits and not by man, and though these marvellous achievements may be less perfect as works of fine art than simple work; they give to the multitude a notion of man's skill and intelligence. A hundred years seems time enough for considerable improvement to be made, but if we go on copying or closely paraphrasing, we shall be no forward in six thousand. Abd-al-Rahman's mosque of Cordova, on the other hand, was built only about 100 years after the Saracens emerged from Arabia, and the Mussulmans were up to that time still engaged in conquest; for Abd-al-Rahman, proposing his mosque, says the Mussulmans crossed the Indus and were preparing to cross the Ganges. The Saracens, like ourselves, almost the whole architecture of the world before them, that of Syria, Palestine, Assyria, Egypt, Persia, Northern India, Northern Africa, Spain and Portugal, not to speak of what they saw in France, on the coasts of Italy, Greece, and Asia Minor, in Sicily, and the other islands of the Mediterranean, and, unlike ourselves, they had no architecture of their own. Their only idea of arrangement in their earliest Congregational mosques seems to have been an open square surrounded with sheds to keep off the sun, the sheds supported with trunks of trees, and with a deep shed in front of the Mihrab, with no fence near the courtyard, but an external close fence to keep off intruders. The Mihrab was the apse, pointing to Jerusalem and afterwards to Mecca. Byzantine architecture was then current in all parts of the Roman Empire, and all their early brick or stone mosques, I probably employed Coptic or Byzantine architecture. The isolated and gigantic columns of the ruins of Persian palaces probably gave them the idea of their minarets, and their early ornamentation geometrical interlaced work was Byzantine. I believe they got the trefoil from Northern India and certainly the bearded battlements from Persia.

I don't know that it would be of much use to us, speaking architecturally, to know what the Saracens borrowed and what they invented; they were enabled to evolve a perfectly new style. Many of those who have studied the architecture of the East are of opinion that they were much greater adapters and popularisers than inventors; but be that as it may, they did create a new style, if not two new styles of architecture—that of Egypt and of the Alhambra. Whatever manufactures they took up with they made superior to all other contemporary ones. After the Arab conquest, the sword-blades of Damascus and Toledo were the most celebrated, many of our stiffs but



names of their towns or manufactures—for instance, Muslin, Dimity, Damask, Mohair, by, Taffeta, &c., while the precious wovens that had texts from the Koran on them, so much sought after that their Christians in the trade used to put Arabic characters on theirs, to deceive the purchasers; or of the figures at the Porta della Carta at Venice has an inscription of this sort round the edge of her dress, that at one time gave great pleasure to antiquaries in trying to decipher it, or pierced and engraved brasswork was equally valued, their enamelled glass is now bought by weight in gold; our word majolica is from an Arab pottery at Majorca, and our word wainmer, a shoemaker, points to the excellence of the leather of Cordova; and when we think they invented a new religion, the number of votaries is the third largest in the world, they introduced our system of arithmetic, algebraic equations, and the mariner's compass, have given us that masterpiece of stories, the Arabian Nights, we should be surprised they were not great at architecture. We may say that their novel introductions were the stained battlements, stalactites, the trefoiling, as an ornamental architectural feature, and the use of new geometrical patterns which were used for decoration.

M. Burgoin's "Les Arts Arabes" the is given to many of these geometrical forms. But quite beyond those few new ideas, they treated everything in a new way. The angles of the square used to abut on each other either grandly moulded, or were taken up into half pyramids and spires. Nooks were greatly used, and there was a passion for having one great bay running the whole length of the building, crowned with a trefoil half-dome, or brought over square by means of stalactites; the main doorway was generally at the bottom of such bays, with the stained and ornamental panels above. I believe the tall bay is a feature peculiar to Saracen architecture. The minarets are, in my opinion, the most important architectural inventions in the Saracen style in themselves that are effective, striking, and picturesque, and may possibly have been the prototypes of the Renaissance steeples.

They contain besides valuable lessons in architecture. In them you see how delightful is the change of one form into another, and how it may be managed, for from a square or oblong solid of hexagonal, octagonal, or circular shape to succeed one another. You can see how a shape is treated and decorated, ascertain the proportions of these separate parts, and note how they compose to make a whole. Then there are different methods of making and accentuating stages. This is only one feature of Saracen architecture, but it contains, perhaps, more than any other. What I want to insist on is this, that Saracen architecture should be studied not to make imitation Saracen architecture, but to help to learn the æsthetic part of architecture itself. We have all sorts of æsthetic elements to solve—for example, enormously high minarets and water-towers, and all kinds of buildings, formerly unknown and undreamt of, and we have to learn how to treat them æsthetically. The abominable Renaissance theory, that all we could do to arrive at perfection was to take Roman work, wants to be obliterated from architects' minds. We are more lucky than the man, the Saracen, and the Gothic architect, in having all their architecture for study as it is, enabling us to improve our skill and widen our culture more than former architects had the chance of doing. Architects should remember, as a rule, the 8th Commandment is as binding on them as on other people, though they are not to be punished for the breach of it; and if they do break it, they are generally rewarded as Dolph was, who stole a lute case, "bore it five leagues and sold it for three halfpence." The good things of other people, other places, other climes are most valuable to the architect to study; but they are generally valueless if seen, because, in the first case, they do not emanate from him who takes them, and, in the second case, do not represent the conditions of present time, and are not fitted to the English taste.

The Romans sometimes ornamented the shafts of columns with figures, leaves, or patterns, but such columns were not commonly used as they are with the Saracens. They used floral ornament largely in friezes and panels, but the Saracens did not confine their floral ornament to such spaces only, but covered with it their domes, and

whole walls, and the circular parts of minarets. They admired, too, their new geometrical patterns so much that they frequently used them in panels instead of floral ornament. The beauty and infinite variety of their lattice-work has never been equalled. The Saracens were Mussulmans, and it was not considered to be orthodox to have figure pictures or figure sculptures in their buildings, so they were driven to the use of Arabesques for architectural adornment.

Egypt has a dry and burning atmosphere; there is almost always a blazing sun in the day-time; there were constant riots and revolutions amongst the Saracens, and the women did not mix with the men in general society, so the conditions under which their architecture was evolved are altogether different from those of England. Their architecture, therefore, is not fit for use here; but, on the other hand, you may learn the most valuable æsthetic lessons from it—new proportions, new arrangements, and the daring to differ from the antique. The Saracens, beginning mainly from Roman and Byzantine originals, worked out a style that is, and has been, marvelled at and admired ever since. Symmetry in the sense of a composition repeated on each side of a centre line is only adapted to symmetrical wants; and as we have a good many unsymmetrical wants, we can learn from Saracen examples how effects can be got without symmetry. This want of symmetry took the fancy of the Venetians, as may be seen at the Palazzo Dario and elsewhere. You are, or ought to be, poets in materials, and you must not only learn the causes, but the methods employed by those who have been successful, before you can show what genius you have got. Besides the gifts I have mentioned, the Saracens had a taste for costliness of material and splendour of colour that rivalled, if it did not exceed, that of the Byzantines. They invented the art of making the coloured and gilt patterns change, on the shifting of the beholder, that no people before or since has accomplished. Much might be said of their defects, but why, when we are enjoying their wondrous gifts and achievements, should we spoil our pleasure by picking out their faults?

#### THE ARCHITECTURAL ASSOCIATION.

The ordinary fortnightly meeting of this Association was held on the 16th inst. in the meeting room of the Royal Institute of British Architects, 9, Conduit-street.

Mr. E. W. Mountford (President) being prevented by illness from being present, Mr. E. W. Woodthorpe, M.A., was voted to the chair.

Several donations to the library were announced, amongst others being the Glasgow Architectural Association Sketch Book, presented by the Glasgow A.A., and the Cornell University Register, presented from that University. Votes of thanks were accorded to the donors.

A special vote of thanks was passed to Mr. Henry Tanner and Mr. John Wilson, for conducting the members over the General Post Office and the additions to the Great Eastern Railway respectively on the 3rd inst.

It was announced that by the kindness of the President, a visit would be paid to the Battersea Town Hall on Saturday, the 24th inst., at three o'clock, when Mr. Mountford would conduct the members over the building.

A vacant seat on the Committee was next filled by the election of Mr. G. H. Fellowes Prynne.

#### London Streets and Buildings Bill.

The Chairman said that a Bill was proposed to be introduced into the next Session of Parliament, to consolidate and amend the present building enactments and statutes of London. The Committee of the Association had appointed a sub-committee, which had sat for two or three weeks, and spent a good deal of time in considering this Bill. That sub-committee now wished to be empowered to lodge a petition against this Bill in Parliament. The Institute had decided to lodge a petition against the Bill, and the Association should be empowered to do the same, should it be deemed necessary or advisable.

Mr. H. L. Florence then proposed "that the Committee of the Association be empowered to prepare a petition, and to present the same, if it should be thought necessary hereafter."

Mr. F. T. W. Goldsmith seconded the motion, which was agreed to *non. mov.*

#### The Last Three Excursions.

Mr. John L. Robinson, R.H.A., then gave a lecture, entitled, "The Last Three A.A. Excursions," illustrated on the screen by photographic views taken by himself. Com-

mencing with the Shrewsbury excursion in 1891, he showed views of the Abbey Church, restored to a considerable extent by Mr. Christian; the old Grammar School, now used as a public library; and the northern doorway of the Church of St. Mary, one of the few examples of a fourteenth-century oak doorway still existing in England. This was followed by an old mansion, now converted into shops; the entrance to the Guildhall, the woodwork of which has been covered with pitch and tar, whereby much of the carved detail has been lost; and a building in Butcher's-row, with a fine angle-post panelled and richly carved. In the latter building the brickwork is of a rich character, and has not been whitened or plastered as in the case of other timbered houses in the neighbourhood. Shrewsbury he considered to be the town in England which contained the largest number of examples of half-timbered work. Grope-lane gave one the idea of a Mediaeval thoroughfare, it being only about 5 ft. wide at the bottom, the upper floors projecting so that people could really shake hands across from the upper windows. A picturesque view was next shown of an old house, called "Whitehall," with its quaint lantern, the dull stone and red tiles producing a charming effect. An old building, termed "Hill's Mansion," now used as a lumber depot, contains some very fine details. Coming to Wroxeter, the site of the Roman Uriconium, a view was exhibited showing the characteristic Roman walls and stonework, with a hypocaust in the foreground. At Benthall the detail is simple, but the house looks well, and some of the internal work is extremely interesting, while the bay windows stand out well from the general elevation. Several views were given of fireplaces in this house, showing some remarkable work. The staircase is the finest feature here, and Mr. Robinson believed it had not been illustrated before. From Benthall the party drove to Much Wenlock, a picturesque village, with an admirable market-house, an old church, the remains of what must have been a fine abbey, and some excellent timber-work. The Prior's House here contains a handsome corridor, with rooms opening out from it, and a valuable collection of thirteenth-century vestments. On the second day Plaish Hall was visited, which reminded one of Compton Wynyates. Being much smaller, though with merits of its own, it could not compare with the beautiful house in Northamptonshire. Plaish Hall, standing as it did in a remote district, had not been restored, while some of its furniture was coeval with the date of the building. One of the features here was the high-cut brick chimneys, and the hall had a minstrels' gallery at one end. The next view was one of Shipton Hall, the front being picturesque, and the porch entered sideways. Wednesday's wanderings included Moreton Corbet, an example of English Renaissance work of the same date as Kirby, Rushton and other buildings erected by John Thorpe, though the detail was coarser and less pleasing. A very extensive building, it was never completed by the man who originally started it—a fate which appeared to have overtaken nearly all John Thorpe's works, which were carried out to a certain extent, but not finished. Several views were shown of Stokesay Castle, including an entrance porch, bits of detail, and the celebrated fireplace with its carved overmantel in oak. The views taken at Ludlow comprised one of the Feathers Inn, where the woodwork has been tarred, so that the carved detail is lost. On the last day of the excursion, Pitchford Hall was visited. This is, perhaps, the most extensive timber building in England, and takes its name from a well of pitch close to the house. Here the dining-room is panelled in oak, with oak beams crossing the ceiling, and contains old furniture. At Acton Burnell, the party were driven by the rain to take refuge in the church, a pure example of thirteenth-century architecture. Mr. Robinson next dealt with the 1892 excursion, when the Association visited Somersetshire for the third time. Several pictures were shown of St. Mary's Church, Taunton, which has the finest Perpendicular tower in England. Driving to Chard, they found it full of old houses, among which the most noticeable were an old inn and the ancient court-house, where Judge Jeffreys held his bloody assize, now used as a store. This latter building contains a coved plaster ceiling, with some very good decorations. Trull Church showed some fine examples of square bench-ends, with carving all round. Poundisford Park, next thrown on the screen, is an old manor-house, now covered with rough-cast. One of the chief features here is a leaden cistern, dated

From Musool, Damietta, Damascus, goat's hair, a meter of Bagdad, and the Persian name for silk stuff.



1671; and there is a magnificent cedar growing up the entire front. Here also is a Queen Anne summer-house, the colouring of the brick work and tiles being mellow and very fine. At Rishton Church, like all the Somerset churches, the tower is the most interesting object, and immediately outside the building is one of the crosses so characteristic of the county. Dunster Church contains some fine examples of oak screens, and Dunster Castle has been considerably modernised internally. Minehead Church has a striking Jacobean communion-table; and Cleve Abbey, next visited, showed some very interesting detail, in a tolerably good state of preservation. Bridgewater was next shown, and then Cannington, where there is a parish church with a square tower; and near by are Blackmoor and Spaxton, both farm-houses, but originally manors. The remaining views were of East Quantoxhead, Nettlecombe, Combe Sydenham, Kingston St. Mary, Cotlestone, and Bishop Lydeard. The excursion of 1893, with headquarters at Diss, he considered the least interesting of all those in which he had taken part. None of the members knew the district well, and it was better to go over old ground than to visit a place on speculation, as was the case in 1893. The churches of this part of East Anglia were typical in the use of flint, and with their clearstories standing very high. The lecturer showed views of South Lopham Church, Quidenham Church, Scole Inn, Kedenhall Church, and Bulham St. Mary. A photograph of Sparrow's House, Ipswich, was shown; and then followed Helmingham, the largest moated mansion in England, where what looked like bricks were really tiles hung on a timber framing. At Brome Hall the gardens are beautifully kept, and arranged in the old quaint style. Wingfield Castle was shown, with its Medieval exterior and modern buildings inside, and the lecture concluded with views of Framlingham Castle and Church, Earls Soham, Fleming Hall, and Eye.

Mr. Florence, in proposing a vote of thanks to Mr. Robinson for his interesting lecture, said that in spite of the fact that the excursions had been carried on for twenty-four years, and the headquarters had been held at as many different centres, numbers of interesting buildings must have been passed over, and the experience gained by the members in these excursions would be useful in framing a new series of visits to the neighbourhoods.

A member seconded the motion, and emphasised what Mr. Robinson had said as to revisiting some of the old places.

After a few words from Mr. Yates,

The Chairman said he agreed with what had been said about going over the same ground again, and it should always be borne in mind that as only twenty-five or thirty members went on the excursions out of the 1,300 members of the Association, there must be many to whom the places would be absolutely new. He might add that he had seen their President (Mr. Mountford) the night before, and they would be glad to know that he seemed to be recovering.

The vote of thanks was then put, and carried by acclamation.

Mr. Robinson, in reply, said he did not see why they should not again go to Lincolnshire, and instead of visiting the churches, rather take up the manor houses; and the same remark would apply to Yorkshire. He believed they would have eventually to revisit many districts, and the Excursion Committee should carefully consider the question of where they were to meet next August.

The meeting then terminated.

**ARCHITECTURAL ASSOCIATION. DISCUSSION SECTION.**—A meeting of the Discussion Section was held at 30 Great Marlborough Street, W., on the 21st inst., when a paper was read by Mr. W. Wonnacott on "The Proposed London Building Act." The discussion was opened by Mr. Strange and continued by Messrs. H. A. Satchell, Stockdale, Hopkins, and Mr. C. H. Brodie, the chairman. The chairman announced that the ordinary general meeting of March next would not be conducted by members of this section, as given in the Brown Book. A vote of thanks to the author of the paper concluded the meeting.

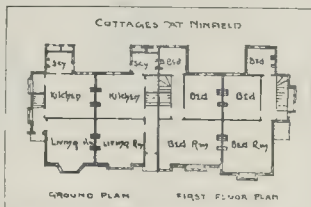
**CLOCK, DRIFIELD.** Mr. Prince Smith, J.P., of Driffield, having erected a water-tower at his residence, has placed an illuminated clock and bell on the side facing the highway. The necessary works were executed from instructions received from Mr. James Ledingham, architect, Bradford, by Messrs. Wm. Potts & Sons, clock manufacturers, Leeds.



COTTAGES, NINFIELD. Messrs. J. S. Price and P. H. Tree, Architects.

#### COTTAGES, NINFIELD.

THESE cottages are to be erected on the estate of Mr. W. F. Boden, at Ninfeld, near St. Leonard's, picturesquely situated, adjoining the Fir Woods. The bricks and tiles will be from the



yard of Mr. Henry Cruttenden, and the oak for timber work home-grown. The architects are Messrs. Philip Tree & Ivor Price, of London and St. Leonard's.

#### ARCHITECTURAL SOCIETIES.

**CARDIFF ARCHITECTURAL, ENGINEERING, AND SURVEYING ASSOCIATION.**—At a meeting of this Association, held on the 7th inst., in the Town Hall, a lecture was given by Mr. P. F. Ruthven on "Steam, Water, and Electric Energy as Motors." Mr. C. Lonsdale presided. Commencing with steam, the lecturer described, by a number of large coloured diagrams, the various forms of engines which have been invented since the introduction of Newcomen's atmospheric pumping-engine for relieving the Cornish mines from water, and showed drawings of Watt's single and double-acting steam-engine, and then proceeded to describe the compounding of the engines by the use of a large and small cylinder. Proceeding to "Water," he explained the principles of hydraulic power, and described the variety of pressure required, from about 40 lbs. in a street main, to some 700 lbs. for a dock gate, and on to 1,200 or 1,500 lbs. per square inch for girder-work, rivetting, &c. He described the application of water-power to electric supply, and instanced the manner in which the Niagara Falls are utilised for generating electricity for the purpose of supplying the city of Buffalo with light, &c. The lecturer concluded with an explanation of the dynamo and motor, and showed how the field of its application is only in its infancy, although such extensive use is already made of the power. He also pointed out the convenience and utility of the gas-engine, and it transpired that recently such engines have been constructed up to 400 horse-power. A model of an electric motor made by Mr. J. Hallaway was exhibited and explained, and the proceedings concluded with a vote of thanks to Mr. Ruthven.

**LEEDS AND YORKSHIRE ARCHITECTURAL SOCIETY.**—On the 19th inst. Mr. D. B. Niven, of London, delivered a lecture in the Law Institute, Leeds, before the members of the Leeds and Yorkshire Architectural Society, on "Como Cathedral; its Makers and its Influences." Mr. G. B. Bulmer, President of the Society,

occupied the chair. Mr. Niven, in the course of some preliminary observations, said that building was commenced by Lorenzo di Spilighi in 1396. The first design was Gothic in character and the west front, as well as the interior of the nave, still remained to show the intention of original designers. Commenting on Bramante's connexion with the work, he said that although this great architect had influenced the design of the whole building he had only actually carried out a comparatively small portion of it. Bramante was entrusted with the work early in the period of the Renaissance, and prepared the design for the covering-in of the uncompleted portions of the Gothic church in the new manner; but so clever was this done that his work, although Classic detail, was Gothic in character, the fusion of styles in this building being most happy. The lecturer proceeded to show how Bramante's design was influenced, not only by the Gothic lines on which he had to work, but also by the fact that he had originally been trained as a painter. He had closely studied the Roman and other classical remains, and this had given him breadth and dignity to his work, and Mr. Niven showed to have been the practice of many of the old masters, who not only studied the remains of antiquity for their detail, but compared one building with another in order to arrive at true ideas of proportion. Bramante had grasped these principles thoroughly, and much of his work was dependent on the early study. After Bramante, the work was continued by two gifted brothers, Tommaso and Jacopo Kodaro, who continued it on the lines which Bramante had laid down, but with freedom and originality in actual design characteristic of that period. In conclusion, Mr. Niven referred to the far-reaching effects of Como Cathedral, showing how it had influenced many of the Renaissance work in the north of Italy, and also how, in all probability, the delicate detail of the work of the French Renaissance could be traced to this source. In Spain, too, there were many indications still existing of designs based on the work of Como. The lecture was illustrated by a number of photographs and plans of the building.—On the motion of Mr. Perkin, seconded by Mr. B. Wilson, a vote of thanks was accorded to Mr. Niven.

**ARCHITECTURAL SECTION OF THE GLASGOW PHILOSOPHICAL SOCIETY.**—At a meeting of this section of the Society, held in the rooms on the 19th inst., Mr. Campbell Douglas in the chair, read a paper on "The Glasgow Building Regulation Act of 1892" was read by Mr. George W. Barr, writer. Mr. Barr stated that this Act is the latest of a series of Acts affecting the city in relation to sanitation, and improvement. Since 1844 sanitary matters have been receiving little attention of the city authorities, but before 1844 no Act existed for regulating properly the erection and alteration of buildings, &c. In 1862 the General Police Act was passed, and in 1866 the Glasgow Police Act was passed. The Act of 1892 has altered and extended the 1866 Act as to buildings, streets, openings, drainage, ventilation, foundations and sanitary details. It is now generally admitted that two great causes of mortality in this and other large cities are diseases of the lungs and rymo-





Estate Cottages, Limsford.—Messrs. J. S. I. Price and P. H. Tree, Architects.

These are largely avoided by spreading the population over as wide an area as possible. Disease existed more than to double the extent in many than in other populated districts. The percentage of Glasgow houses of one and two apartments is about forty-five, and of houses over three apartments eleven. Mr. Barras gave outline of the provisions of the Act of 1892, giving special attention to the clauses in regard to ventilation and drainage, the height of buildings, and the cubic contents of apartments. The question of the ventilation of hollow squares, he stated, had aroused much difference of opinion, but it had been proved that small hollow squares are unhealthy and to be avoided. The question of free space had been brought before the Court of Session, both under the Act of 1866 and the 1892 Act, and the Court in a recent case held that the Act of 1892 did not repeal or modify the provisions of the Act of 1866 in this respect, but was simply explanatory thereof. A vote of thanks was awarded to Mr. Barras for his paper.

#### THE SURVEYORS' INSTITUTION:

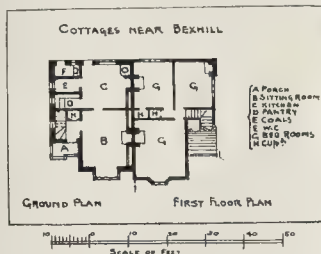
LONDON STREETS AND BUILDINGS BILL.

A MEETING of the Surveyors' Institution took place on Monday, at Great George-street, Westminster, when the discussion was resumed on Mr. Henry Blackburn's paper, read a fortnight ago, on the County Council's "London Streets and Buildings Bill, 1894."\* Mr. C. J. Shoppee, President, occupied the chair. The paper was divided into the following heads:—(1) A consideration of the lines legislation should follow; (2) the new points which have of late years arisen in legislation; (3) alterations that were needed and have been made; (4) alterations that appear weak, or in some cases, too severely stringent, and in other cases confiscatory, and which it is to be hoped will be revised before the Bill passes into law. Mr. A. R. Stenning admitted that a new Bill was necessary incorporating existing Acts, amendments and bye-laws, and thought the one drafted by the County Council met all the requirements of the present day. He, however, objected to public improvements being made at the cost of private owners. Mr. Collins, District Surveyor for the Eastern Division of the City, condemned the "confiscatory" clauses of the Bill, which he regarded generally as obnoxious, unfair, and immoral, and designed on the principle of middle and middle. Mr. Woodward concurred. Mr. T. Clashill, Superintending Architect of the County Council, said that body was desirous of listening to every reasonable objection to the Bill, and still had various suggested alterations under consideration with a view to improving the measure. Mr. Wheeler, Q.C., described the omission of all reference to compensation in the Bill as "robbery," and agreed with the President that certain clauses were incompatible with justice and with the true interests of the public. Mr. Sedalls, jun., also took part in the discussion.

\* See Builder for last week, page 150.

#### COTTAGES AT LIMS FORD.

THESE cottages at Limsford, near St. Leonard's-on-Sea, are for the accommodation of the labourers of Mr. Henry Cruttenden, working on the Home Farm. The walls up to the chamber floor are faced with light lemon-coloured handmade bricks from his yard on the estate, where



also the tiles for the roof came from. Oak left from the plane for the half-timbered work. Besides the accommodation shown on the plans, there is a wash-house at the back, common to both cottages. Messrs. Philip Tree & Ivor Price, of London and St. Leonard's, are the architects. The scale of feet here applies also to the plan of the Ninfield Cottages, on the opposite page.

#### ENGINEERING SOCIETIES.

INSTITUTION OF CIVIL ENGINEERS.—At the meeting of this Institution on the 20th inst., Mr. Alfred Giles, President, in the chair, the paper read was on "Forging by Hydraulic Pressure," by Mr. R. H. Tweddell, M.Inst.C.E. The paper commenced by a brief history of the development of the hydraulic forging-press since the year 1846, when the late Sir Charles Fox proposed the attachment of different tools for the working of hot or cold iron to the tables of the Bramah press. The author then formulated the following conditions as necessary to be fulfilled to ensure success in hydraulic forging: first, the press must be so proportioned as to ensure the utmost rigidity, any movement of the main columns, of course, interfering with the correctness of the work; secondly, the crane-power must be not only ample, but so arranged that weights reaching to 100 tons could be manipulated by unskilled labourers; thirdly, the details of the construction of such parts as the valves and pumping arrangements must be as perfect as possible.

THE CIVIL AND MECHANICAL ENGINEERS' SOCIETY.—A paper was read before this Society on the 15th inst., by Mr. G. R. Steward, M.I.M.E., on "Smoke-Preventing Furnaces," with the object of showing the progress that had been made of late years in perfecting these appliances and the present position with regard to the "smoke nuisance," for the author was of opinion that there was every evidence that very strict legislation would soon be brought to bear in this direction. A description was given of different varieties of furnaces, particularly mentioning several of the more successful of the

modern smoke-preventing furnaces, such as the "Schomburg," the "Vicars," the "Hodgkinson," and others. Amongst these furnaces were sprinklers, coking stokers, and hand and automatically fired furnaces. The author also referred to means of preventing smoke other than the expensive methods above stated, such as the mechanical adjustment of furnace-doors, &c. Having had some years of practical experience in providing a means for the better prevention of smoke, it became very evident to the author that more was required than a sufficient supply of air, which was in many cases the only object aimed at, for, although that is an all-important element, smoke when mixed with air in large quantities, is frequently hurried away too quickly into the flues, and the gases from the fuel in consequence do not combine, and a smoky chimney is the result; it is, therefore, necessary to hold in check the progress of the gases and air until they are wholly and completely commingled and perfect combustion has been attained. After many trials, extending over several years, the author had the satisfaction of witnessing a practically smokeless chimney, and this result was arrived at by means of a new and simple smoke-preventing appliance, which will be worked from the furnace front without expensive machinery, and without alteration in the construction of the furnace. This appliance is so arranged as to produce an eddy of air or baffle inside the furnace. It can be made to suit any furnace. This invention was not particularly described, as the patents for it had not been completed yet in Germany and France. A discussion at the close of the reading of the paper ensued. Among those who took part therein were Messrs. T. C. Walrod, Vice-President, E. H. G. Brewster, Hon. Sec., R. Booth, Thos. Parr, and W. B. Robertson.

LIVERPOOL ENGINEERING SOCIETY.—The fortnightly meeting of this society was held in the Royal Institution, Colquitt-street, on the 14th inst., Mr. H. Percy Boulnois, M.Inst.C.E., President, in the chair, when a paper was read by Mr. James Morgan, Assoc. M.Inst.C.E., Chief Surveyor of Roads to the Liverpool Corporation, on "Street Pavements," in which the author, dealing exclusively with the impervious pavements laid under his supervision in Liverpool since 1872, described the method adopted in forming the concrete foundations for carriageways; the results of experiments on the wear and durability of the different stones used for paving in heavy-traffic streets; experimental pavements of various kinds laid with a view to mitigate the noise of traffic; asphalt and wood pavements, with details of their wear and cost; and a comparison of the merits of different classes of wood used for paving. Statistics were given showing the relatively greater wear of steel tramway rails in comparison with granite sets. The question of subways for water, gas, telegraph and other mains was dealt with, and the desirability of such provision in the streets was shown by the fact that in 1892 and 1893 453 and 403 miles respectively of trenches were cut for these purposes in the carriageways and footways of this city. After briefly describing the footway pavements, the writer concluded by stating that when he read his last paper upon this subject, in 1882, there had been laid 650,000 superficial yards of impervious pavements in Liverpool, that there are now 1,810,948 superficial yards of this class of pavement, and he dwelt strongly upon the necessity of continuing the construction of impervious pavements, more especially in densely-populated districts, where they are almost essential if the public health is to be maintained.

#### COMPETITIONS.

NORTH WALES COUNTIES ASYLUM, DENBIGH.—The adjudication on the plans submitted in this competition has been completed, and from the four designs (Nos. 9, 10, 11, and 13) selected by the assessor, Mr. Edward Salomons, the Committee of Visitors selected No. 10 as the one most suitable for their requirements. The remaining three are entitled to a premium of 50*l.* each. On the seals being broken, the authors of the selected designs were found to be as follows:—No. 10, Messrs. C. O. Ellison & Son, Liverpool; No. 9, Messrs. J. D. Mould & Percy Lovell (Joint Architects), Manchester; No. 11, Messrs. James Aspinall & James Smith (Joint Architects), Blackburn; No. 13, Messrs. Stanger & Stanger, Wolverhampton.

POLICE STATION AND BATHS, NEWCASTLE.—The competitive designs for the new Corporation baths and wash-houses at Gallowgate, Newcastle, and for the new police-station at Scotswood, were on view on the 19th inst., in the Town-hall,



Newcastle. The awards in the competition were as follows:—Baths and wash-houses—Mr. Gibson Kyle, Newcastle, 1; Messrs. Marshall & Dick, Newcastle, 2; Mr. F. W. Puxer, Newcastle, 3. Police-station—Messrs. Marshall & Dick, 1; Mr. Stephen Piper, Newcastle, 2; Messrs. Fraser & Liddle, Newcastle, 3. All the plans were on exhibition, except those of Mr. Gibson Kyle, for the new baths, the plans being required for the work.

### Illustrations.

#### PIERCED MARBLE SCREEN, RODEZ CATHEDRAL.

**T**HIS drawing is of a pierced panel in a marble screen, across a chapel, in one of the choir aisles of Rodez Cathedral. The screen is of a familiar Early Renaissance type, with central doorway and two side arches, filled in with these pierced panels. In plan its ends are canted slightly forward, and finished with pilasters, the whole being crowned by an entablature. The pierced work commences at 4 ft. from the floor, and is executed in marble 12 in. thick, the inside faces being similar, except in a few minor points, to the exterior. The width of the whole panel is 4 ft. 8½ in.; so that the illustration is rather more than one-sixth the actual size. The Renaissance work south of the Loire is not so well known, and is generally regarded as inferior, although there is sometimes a boldness in its design which some will regard as compensating for its defects of detail. The work is said to be mainly due to some Italians travelling through the country to the various centres of work, or else to their influence, and not so much to the effect of Spanish taste, in spite of the nearness to the Pyrenees, which led me to expect work of a similar kind on the other side.

Rodez is not well known at present, although it is the capital of the department of Aveyron, so named from the river near which it is situated. It is reached from a junction on the main line to Toulouse, which, skirting the mountainous district of Auvergne, passes through some much admired scenery, surpassed, however, in my opinion, by that on the branch line to Rodez itself. The railway winds round the mountain sides, affording distant views of the broken country, of fields of reddish earth, or else of luxuriant green, and of the banks of the slow-flowing river lined with tall poplars.

Rodez itself is high up, and the cathedral, occupying the summit, is a mass of dark red stone, flanked by a tall tower of slightly confused outline, which, like the rest of the church, is in a bold version of Late Gothic, elaborate, but with large masses of walling, and which, though rather coarse, and incorrect, as compared with northern Gothic, possesses a character of some grandeur. The furniture is rich, the splendid organ-case of wood, piled up in the whole end of the transept, is perhaps the finest of the style; and the drawing given in "La Renaissance Monumentale en France" was the motive of my visit.

The high situation of the city made it not too hot for a stay at the end of July; indeed, some days were cold and wet, and a visit to Conques and some other excursions had to be abandoned. A series of curious diligences set out from the town in various directions towards the Pyrenees, &c., bringing in at times curious country folk, speaking a very mixed dialect. The direct railway from Albi, now in progress, will shortly render the place easy of access.

Very pleasant walks are to be obtained by descending the hill on its various sides and by ascending the opposite slopes, when Rodez may be seen as a low mass occupying the line of the hill, broken only by the imposing body of the cathedral. The slopes below are marked in long diagonal lines of stone-walled roads, ascending in slow inclines to the town above; but, too numerous to be regular, they do not destroy the hill character of the site.

A. T. B.

#### MOSQUE AND TOMBS OF CALIPHIS, CAIRO.

**T**HREE buildings are illustrated this week, at the request of Professor Atchison, as an accompaniment to his fourth Royal Academy Lecture on "The Advancement of Architecture."

The mosque, called that of the Emir Yakhor, lies to the east between the citadel and the Mosque of Sultan Hassan. Its date is about the middle of the fifteenth century. It is remarkable for the twin terminations of the minaret, which is

square on plan, and the elaborate decoration of its dome, second only to that of Kait Bey.

The "Tombs of the Caliphs" are outside Cairo. The dome in the foreground is that of the Tomb-mosque of El Ashraf Bursabey, and dates from 1435. The tomb in the distance may possibly be that of the Sultan El Ashraf Ennal, who reigned 1453-1460, A.D. The others are not known.

#### NEW CHANCEL AISLE, DONHEAD ST. ANDREW'S.

**T**HIS aisle forms part of a scheme for enlarging this parish church, and the sketches sufficiently indicate the connexion of the new with the old work. The church consists of nave with aisles, chancel, and western tower. The old work is mainly of late fifteenth-century date; the nave arcades are of four bays, and possess points of considerable interest and richness; the eastern-most arch on each side is a narrow one, under 3 ft. wide. With the exception of these arcades, the old work is poor, and has been much spoilt by injudicious restoration in 1826 and 1838, at which latter date new windows were inserted in the chancel, and the chancel arch was carried eastwards about 12 ft., extending the nave at the expense of the chancel; a clearstory was at the same time added to the nave, the effect of which is to dwarf the tower.

The nave arcades have been taken as the type for the additions.

The drawings were exhibited at the Royal Academy last year. C. E. P.

#### ST. MARY'S CHURCH, HORSELL: INTERIOR AS RESTORED.

**T**HIS sketch, showing the roof-screen and chancel of the church, was exhibited at the Royal Academy last year. The architect is Mr. W. F. Unsworth, to whom we have twice written for further particulars about the work, which, having no reply from him, we are unable to give.

#### ENTRANCE LODGE, CHILTON.

**T**HIS lodge forms part of an extensive scheme carried out recently at Chilton Lodge for Sir William Pearce, Bart., M.P., consisting of alterations and additions to the mansion, farm buildings, stabling, cottages, &c.

The walls are faced with red brick, the verandah, gables, and cornice being of wood painted white, and the frieze being rough-cast. The roofs are covered with Westmoreland green slates. The works were all carried out by Messrs. J. Simpson & Sons, of Paddington-street, W. Mr. Arthur C. Blomfield was the architect. The drawing was exhibited at the Royal Academy last year.

#### THE LONDON COUNTY COUNCIL.

**T**HE usual weekly meeting of the London County Council was held on Tuesday in the County Hall, Spring Gardens, Mr. John Hutton, the Chairman, presiding.

**Proposed Extension of Sewer.**—The adjourned report of the Main Drainage Committee was as follows:—

"Our attention has been called to the want of proper main sewer accommodation in Lower Streatham, and it has been suggested that the Wandale branch sewer, hitherto known as the (Graveney brook) should be extended from its present termination near the culvert under the Tooting and Merton branch of the London, Brighton and South Coast Railway, in a line with Besley-street to the county boundary at Norbury-bridge. The proposed sewer will be a continuation of one constructed by the late Metropolitan Board of Works, and will practically be in the line of the Wandale river (branch), which is an open brook vested in the Council as a main sewer under the Metropolitan Management Act, 1855. A large portion of the district that would be directly affected by the construction of the new sewer is not yet built upon, but a large area, near the boundary already built upon and which is at present inefficiently drained would be afforded proper drainage. It appears that in 1881, after complaints had been received of nuisance emanating from the Wandale branch open sewer, a 15-in. pipe sewer was laid down to divert the sewage from the upper end of the river, but this outlet is totally insufficient to meet present requirements, and consequently during heavy rain the houses are flooded with sewage. The matter has been carefully considered by a sub-committee, and having conferred with the solicitor as to the position of the Council with reference thereto, we have come to the conclusion that the suggested sewer, which will be 3 ft. 9 in. by 2 ft. 6 in. in size and about 3,500 ft. long, should be constructed by the Council, the cost being roughly estimated at 9,000l. The owners of the estate

through which the sewer will pass state that they will not claim compensation for easement provided the sewer is laid down in the line of a new road to be formed across the estate, and to this we think the Council should agree. We recommend—

"That the Council do approve of the construction of a proposed sewer along the line of the new road to be formed by the owners of the estate, and that the engineer be empowered to prepare the necessary plans and estimate the cost of the work, with the view of its being carried out by the Works Department."

Mr. Benn, M.P., on behalf of the General Purposes Committee, moved the addition of the words referring the recommendation to the Parliamentary Committee to consider and report to the desirability of a clause being inserted in one of the Council's Bills, to enable the Central Authority, like the Local Authority, to levy special rate in any area specially benefited by new works.

With this addition the recommendation was adopted.

**Drainage of Fulham and Hammersmith.**—The same committee also brought up the following report respecting the drainage of Fulham and Hammersmith:—

"Numerous complaints have from time to time been received of the insufficiency of the main sewers in the low-lying districts of Fulham and Hammersmith, and strong representations on the subject have been made to us on more than one occasion by the two vestries concerned. The district in question lies to the north-east of the Council's western low level sewer, which commences at Chiswick, and passing by Hammersmith and Walham Green, discharges into the western intercepting station. On the north it is bounded by the Acton branch sewer, and on the east by the Counter Creek sewer, which runs generally parallel with the West London Extension Railway on its eastern side. The Council's sewers in the Grove, Lena Gardens, Brook Green, Shepherd's Bush, and Shepherd's Road, discharge into the intercepting sewer near Walham Green by means of a 4 ft. by 9 in. sewer, which commences in Shepherd's Bush-road, and passes along Brook Green and North End-road to Walham Green. This latter sewer is a local sewer belonging partly to the Vestry of Hammersmith and partly to the Vestry of Fulham, and it is to its incapacity to perform its functions that most of the complaints which have been made are due. In the course from the Kensington and Hammersmith roads it receives the flow of at least five sewers of the same capacity, and it becomes therefore naturally surcharged. To overcome the difficulty the engineer suggests that a new 4 ft. by 2 ft. 8 in. sewer should be constructed from Hammersmith-road some distance to the west of North End-road, Walham Green, where it will join the intercepting line. The sewer will, if constructed, form a proper outlet for the Council's sewers to the north-westward already referred to, and will intercept the sewage from the sewers in Hammersmith-road, Greyhound Lane, and Lillie-road, and thus relieve the sewer at North End-road. The preliminary approximate cost of the proposed sewer is 25,000l. It is further suggested that the existing local sewer in Brook Green, and from there along Hammersmith-road to the end of the proposed new sewer, or a length from 800 to 900 yards, should be taken over by the Council, and declared a main sewer. There would then be a main sewer connecting the present sewers in Shepherd's Bush-road and Brook Green-road with the Council's intercepting sewer at Walham Green. Having carefully considered the above proposals, we recommend—

"(a) That the Council do approve of the construction of a new sewer from Hammersmith-road to Walham Green suggested by the engineer; and that he be instructed to prepare the necessary plans and estimate of the cost of the work, with a view to its being carried out by the Works Department."

"(b) That the Council do make an order under s. 14 of the Act of 1855, authorizing the Vestry of Fulham to purchase the portion of Hammersmith-road, as proposed by the engineer, to be a main sewer vested in the Council; and that the solicitor be instructed to prepare such order."

The recommendations were agreed to.

**Open Space at Deptford.**—Mr. Torrance brought up the report of the Parks Committee, which recommended the Council to purchase, at an approximate cost of 36,000l., and for the purpose of an open space, about seventeen acres of land in Lower-road, Deptford, conditionally upon the Council's contribution being limited to 24,000l.

Mr. Lloyd moved, and the Rev. Clement Williams seconded, an amendment to refer the recommendation back with a view to acquire an additional piece of land.

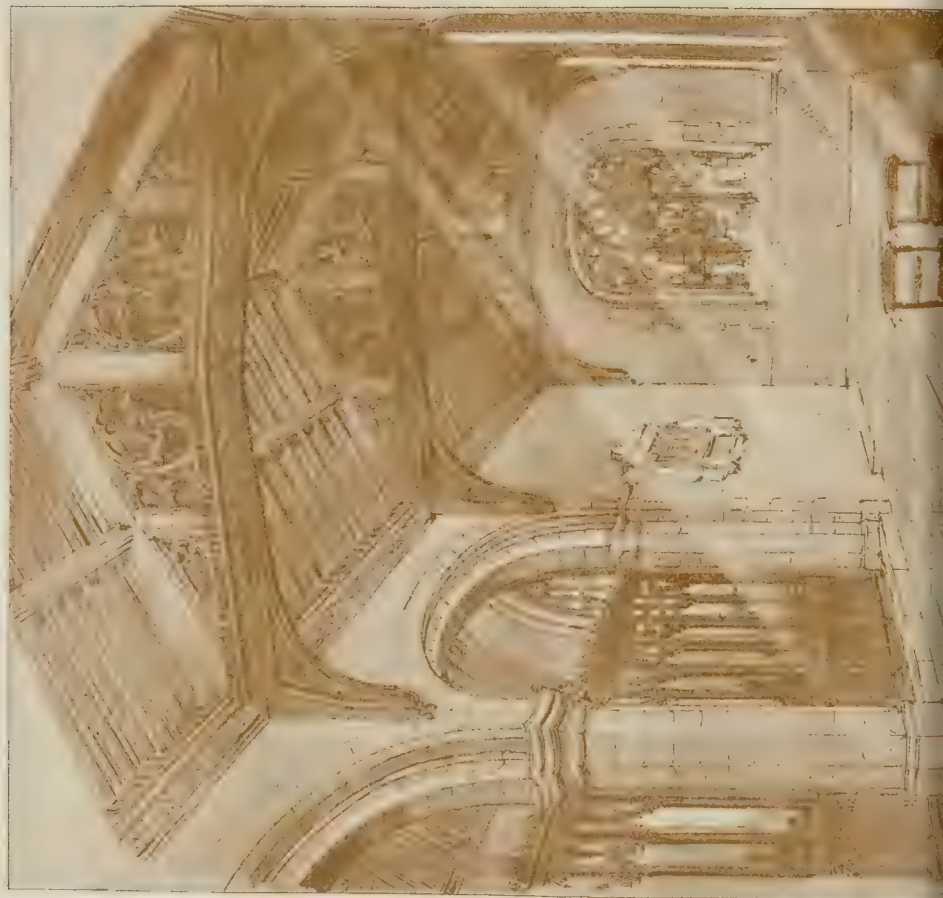
The amendment found only seven supporters, and the recommendation of the Committee was adopted.

**The Condition of Regent Canal.**—The Public Health and Housing Committee reported that they had for some time had before them the question of the insanitary condition of the Regent and Grand Junction Canal. From the report of





THE BUILDER FEBRUARY 24 1894





EXTERIOR VIEW.

POHLHEAD ST ANDREW'S CHURCH PROPOSED CHANCEL AISLE MR CHARLES E FOSTING ARCHITECT









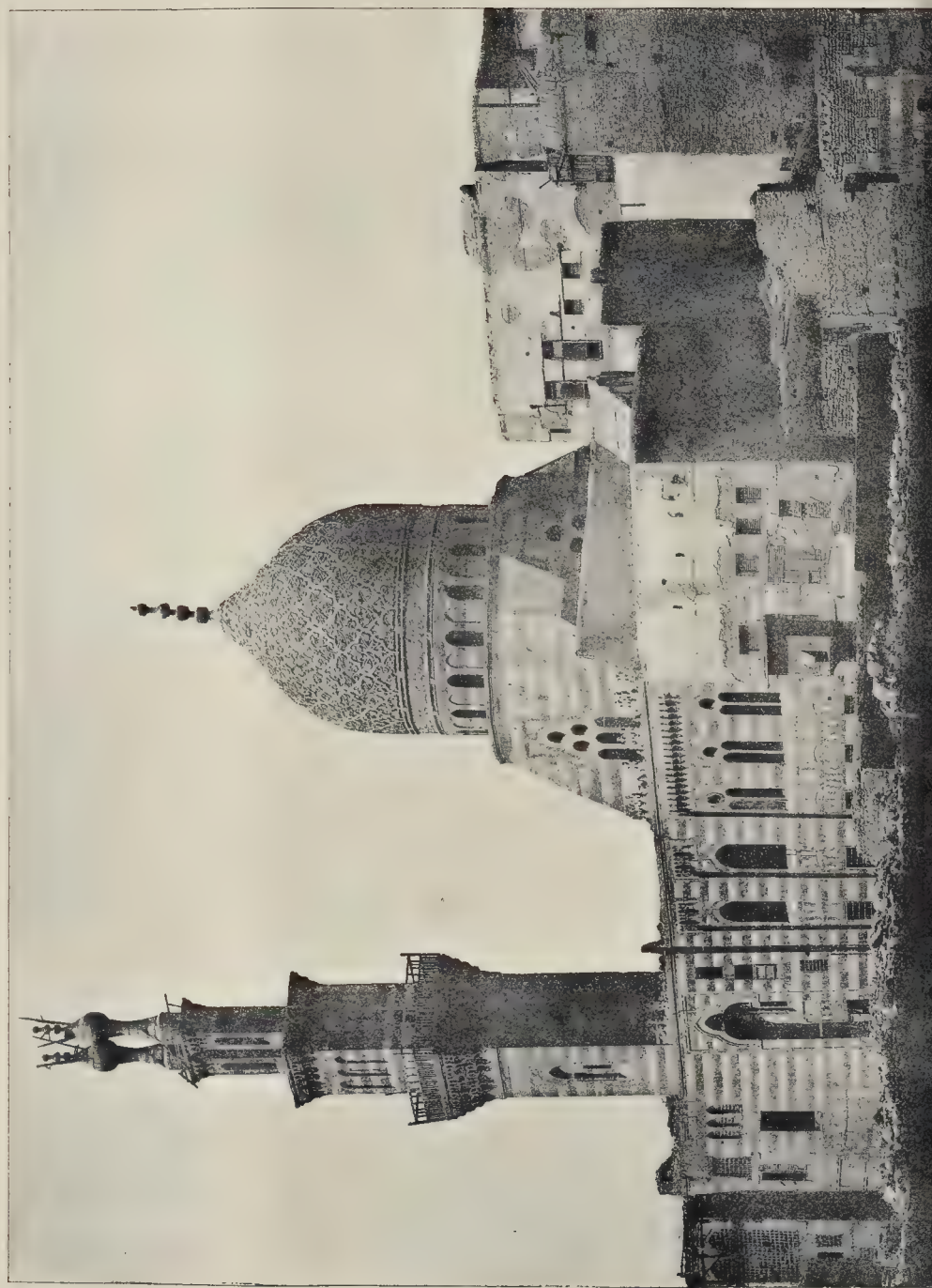
A detailed architectural drawing of the interior of a large, vaulted hall, likely a church or cathedral. The drawing shows the intricate ribbing of the vaulted ceiling, the large arched windows, and the ornate Gothic-style architecture. The perspective is from within the hall, looking towards the far end where a large, ornate altar or apse is visible. The drawing is signed "J. G. 1850" in the bottom right corner.

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THE BUILDER. FEBRUARY 24, 1894.





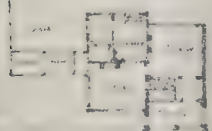
TOMBS OF THE CALIPHS, CAIRO

*(Published as an illustration to Professor Nicholson's Royal Academy Lectures.)*



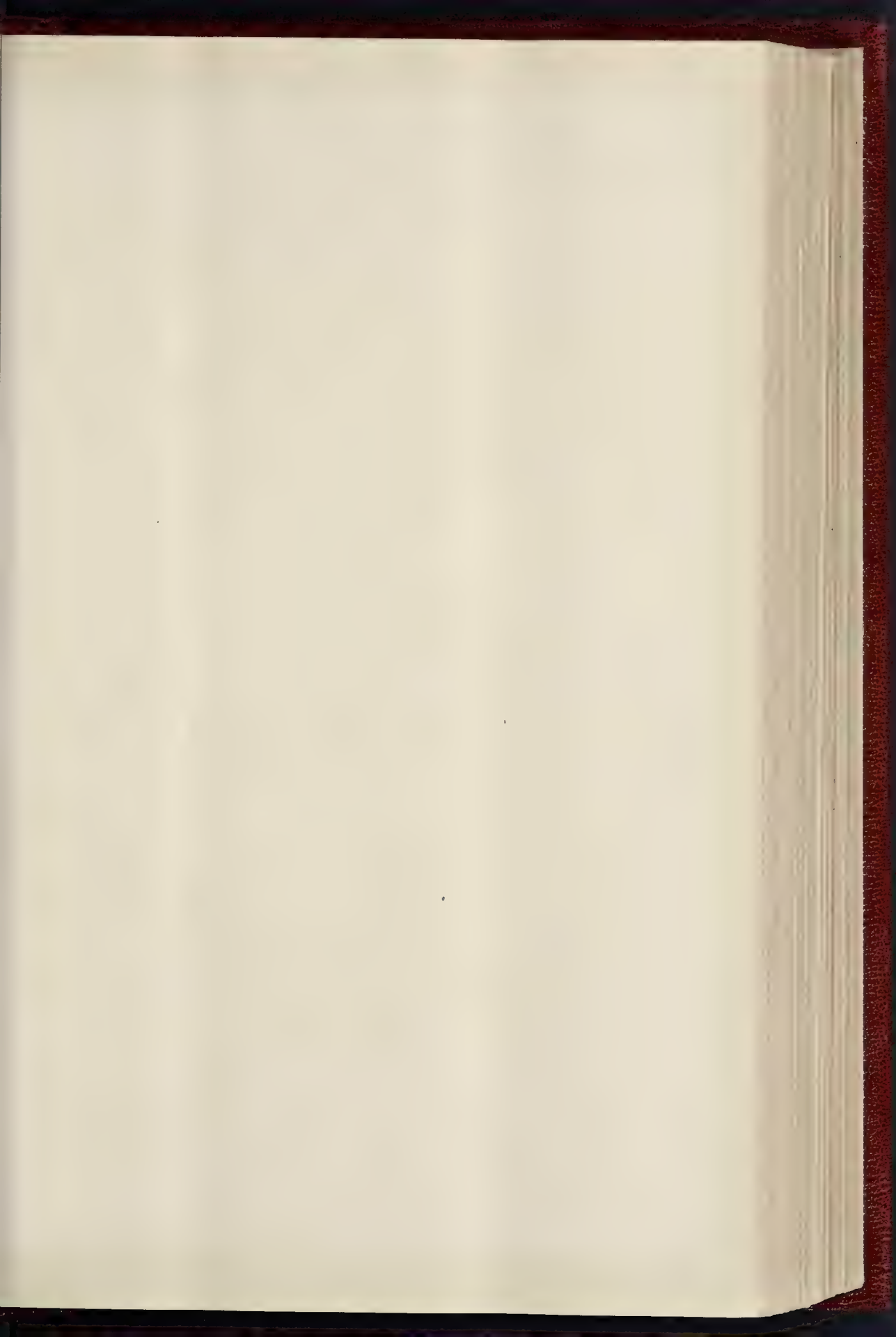


LODGE AT CHILTON. Arthur C. Benson, M.A.  
Architect.











THE BUILDER, FEBRUARY 24, 1904.





11. PHOTO. 2000. 2. 1. 2. 3. 4. 5. 6. 7. 8. 9. 10. 11. 12. 13. 14. 15. 16. 17. 18. 19. 20. 21. 22. 23. 24. 25. 26. 27. 28. 29. 30. 31. 32. 33. 34. 35. 36. 37. 38. 39. 40. 41. 42. 43. 44. 45. 46. 47. 48. 49. 50. 51. 52. 53. 54. 55. 56. 57. 58. 59. 60. 61. 62. 63. 64. 65. 66. 67. 68. 69. 70. 71. 72. 73. 74. 75. 76. 77. 78. 79. 80. 81. 82. 83. 84. 85. 86. 87. 88. 89. 90. 91. 92. 93. 94. 95. 96. 97. 98. 99. 100.

PIERCED MARBLE SCREEN, CATHEDRAL OF RODEZ, FRANCE. DRAWN BY MR A T BOLTON, ARI BA





the medical officer it appeared that the main reasons for the foul condition of the Regent's Canal were:—1. The collection of mud at the bottom of the canal from insufficient dredging. 2. The insufficient flow of water producing an almost stagnant condition. 3. The collection of decomposing material on the surface of the water. 4. The droppings from barges, and the smell of refuse from gas-works while conveyed by barges. The only serious discharge of sewage into the canal was from the Zoological Gardens. The cleansing of the wharves and frontages was the duty of the occupier, the companies being only concerned with the waterway. With regard to dredging the mud along the whole length of the canals the Council had no more power than was given by the Public Health Act when a nuisance exists, and then only in default of a sanitary authority. The Rivers Pollution Act, which was applicable to canals, was cumbersome and slow in its operation. Legislation, the report added, was evidently wanted to enable the central authority to deal directly with the canal in its course through London. The committee recommended that a copy of the report be sent to each of the sanitary authorities concerned.

Dr. Collins, on behalf of the General Purposes Committee, proposed the following amendment:—“That the recommendation be referred back to the committee, with a view to the committee considering and reporting more fully whether action cannot be taken under the Public Health (London) Act, 1891.”

Mr. Crooks seconded the amendment.

After further discussion, the amendment was negatived.

Mr. Lloyd then proposed a further amendment:—

“That the opinion of counsel be taken whether it would be competent for the Attorney-General, if called upon by the Council, to proceed by public indictment against the Grand Junction and the Regent's Canal Companies for creating a public nuisance by their neglect of the proper management of their canals and basins within the metropolis.”

Mr. Holmes seconded the amendment, which was carried.

*Policy of the Council as to Water Supply.*—The Water Committee brought up the following report, the consideration of which was adjourned until next week.

“We are of opinion that the time has now arrived when the Council should formally declare its views with regard to the future water supply of the metropolis, and should take active means for carrying those views into effect. We consider, indeed, that the matter is one of serious urgency, and that any great delay would probably be very injurious to the public interests. Our reasons are these: The Royal Commission has now reported; and although we could have wished that its investigations had taken a wider range, we must accept what it has produced, subject of course to criticism, and to outlining facts and considerations. The public in general will expect that its conclusion will be followed up by practical measures; and unless the Council adopts some comprehensive plan of action, the companies will undoubtedly seek enlarged powers, and will rely upon the report of the Commission in support of their applications. Indeed, as the Council is aware, no less than three of the companies have already prepared schemes involving a large increase of capital, and sooner or later, most of the others will have to follow their example. The result of allowing these powers to be obtained without checks or modifications would obviously be to greatly increase the difficulty of the ultimate municipalisation of the water supply. As already stated, we shall be prepared in a short time to make recommendations for dealing with these Bills; but in our view the probability of those recommendations being accepted by Parliament will greatly depend on whether the Council is prepared with a general declaration of policy on the whole subject. In these circumstances we offer a few observations by way of introduction to the important recommendations which terminate this paragraph. We assume, and we think rightly, that the Council is of opinion that the only acceptable solution of the general problem is, that the ultimate control of the water supply of the metropolis should be transferred from the companies now exercising it to the London County Council. We believe that this has been the view of the Council throughout the whole period of its existence, and we think it is also the view of the public of London. It has always been taken for granted in this committee, and has constantly been stated in the Council. It was formally declared by the Council on October 13, 1891; and the legislative powers which the Council has on two occasions obtained for spending money on water inquiries and for promoting bills relating to the water supply, were avowedly ancillary to the same general object. The like remark applies to the Council's Water Bill recently introduced. That Bill, it will be recollected, seeks powers to acquire water-bearing areas and

easements of water with a view to the supply of London. The Council even resolved at first to include in it an application for powers of supply; but of these latter powers the Parliamentary Committee, with our concurrence, for reasons partly technical and partly practical, recommended the abandonment. The Bill as it stands has been adversely reported upon by the Examiner on Standing Orders; and we shall have later on to consult with the Parliamentary Committee as to the course which the Council should be recommended to take with it. But whether it be proceeded with or not, the necessity of action by the Council is not the less real. The chief engineer under our instructions, preparing a report on the site and yield of different sources of water supply, and as to the method which might be adopted for storing and conveying water to London, with estimates of cost. When this is complete we shall at the earliest possible moment present a further report to the Council on the subject. What then is the first step to be taken? This question has occupied our anxious attention for a considerable time; and it is only after the fullest discussion and consideration that we have decided upon making the recommendations which follow. It is quite obvious that the great obstacle in the way of the Council's becoming the water authority is the existence of enormous ‘vested interests’ in the hands of the water companies. No real progress can be made until the Council fully recognises this fact, and makes up its mind how to deal with it. It may be recollected that the Select Committee on the Water Bills of 1891 expressly approved the principle that the London County Council should be the water authority; but coupled with that approval as a condition precedent that the companies’ undertakings should be taken over. The Council declined to accept that condition in the unconditional form in which it was expressed; but nevertheless affirmed, on October 13, 1891, its willingness to purchase the undertakings ‘on fair and reasonable terms.’ We think this is a sound view, and we believe that the Council still entertains it. If we are right in this belief the present appears to us an extremely favourable moment for commencing negotiations with that object. Collaterally, too, as a declaration of the policy of the Council it will place us in a better position to deal with the Water Bills now before Parliament. Of course the expression ‘fair and reasonable terms’ will have to be interpreted, and to be put into the shape of concrete conditions, as to which it will be our duty to report at a later date. Meantime we have thrown our recommendations into such a form as will, in our opinion, amply safeguard the interests of the public of the metropolis. We accordingly recommend—

(a) That negotiations be entered into for the purchase of the undertakings of the water companies, or one or more of them, at a fair and reasonable price, on the basis of a desire to purchase and willingness to sell; having regard to any circumstances and statutory provisions affecting the present and prospective position, income, expenditure, liabilities, obligations, and value of the companies respectively and their undertakings, including any present and probable future demands for supply, and any existing, proposed, and new or additional sources of supply, and on the understanding that if satisfactory terms cannot be mutually agreed upon an application will be made to Parliament to determine in what manner and on what conditions a transfer to the Council shall be arranged.

(b) That the Water Committee be authorised to negotiate on the above lines, and to prepare details of the basis of arrangements.

After transacting other business the Council adjourned at 7 o'clock.

## Books.

*Mechanics and Mechanism.* By ROBERT SCOTT BURN. Seventh edition. London: Ward, Lock, Bowden, & Co. 1892.

THIS book contains elementary examples of the leading principles of mechanics, together with practical diagrams and artistic illustrations of the principal mechanical movements, and details of mechanical construction and machine gearing, designed for the use of schools and home students. It forms part of a popular educational series, and gives a ready insight into the constructive forms and arrangements of general mechanism, as well as the methods by which the movements are produced. In dealing with mechanics in actual practice, the author proceeds to explain how a crank is made, what is its form and use, how it is fixed to a shaft, what constitutes a connecting rod, how it is constructed, how connected with the crank; in short, the arrangement of the various parts and how fitted together, as exemplified in actual working machinery. Again, in describing the nature and uses of a shaft, an explanation is given of its distinguishing features, and of the method of making the journals and the means of reducing the friction of their revolutions. It is shown that machines do not beget force. They only apply that which has been communicated to them in an easy, advantageous manner. The system of pulley and band or belt driving, as compared with a system of toothed

wheel gearing, is investigated in such a manner as to provide quite interesting reading. As an introduction to more abstruse treatises, the book can be very profitably perused and digested in the mind of the young student, and will encourage a desire to learn the more advanced theory of mechanical movements and principles of machine construction.

*Architectural, Engineering, and Mechanical Drawing Book.* By ROBERT SCOTT BURN. Tenth edition. London: Ward, Lock, & Bowden, 1893.

AFTER describing the appliances and instruments required in the delineation or drawing of both architectural and engineering subjects, the author proceeds to deal with, first, scales, projections, plans, elevations, sections, and working drawings; second, the draughtsmanship connected with the delineation of machine driving-gear, pulleys, and toothed wheels; and third, the shading and colouring of mechanical drawings. The proportions and methods of delineation for the five orders of architecture are so fully described that the book cannot fail to prove most useful to the home student for self instruction. Throughout the work the value of centre lines to serve as datum lines from which to measure either side is self-evident. So many beginners fail to realise this, at the outset, that Mr. Burn will have contributed to them important aid by his clear demonstration of this fact. The methods adopted for graphically delineating the various features of a country or district upon a map are very ably portrayed.

*The Principles of Fitting.* By A. FOREMAN PATTERN-MAKER. London: Whittaker & Co. 1893.

THE author of this practical work, appended to which are a number of useful shop notes and memoranda, is also known as the writer of “Pattern-making,” “Practical Ironfounding,” “Metal Turning,” “The Amateur's Workshop,” “Toothed Gearing,” “Helical Gears,” and as the editor of “Lockwood's Dictionary of Mechanical Engineering.” The substance of the present volume is a reproduction of a series of articles from “The English Mechanic.” We mention this to show that the work is no hasty composition, but probably the result of much thought, previous experience, and of a record made over the period of time embraced by these articles. As a connected account of the principles which underlie the practice of the trade, the work is likely to prove useful to apprentices, and its value is increased by the author informing us that “Fitting” is one branch of that extensive practice of mechanical work to which the whole of his life has been devoted.

*The Locomotive Engine and its Development.* By CLEMENT C. STRETTON. London: Crosby Lockwood & Son, 1892.

THIS work claims to be a popular treatise on the gradual improvements which have been made in railway engines between the years 1803 and 1892, and the author traces the development of the locomotive from the old carriages propelled by steam, which were constructed to run upon ordinary roads, to the present express engines upon main lines of railway. We have a description of the early engines employed upon public as well as private lines, first for the conveyance of goods and minerals, and subsequently with passenger carriages attached. The old broad-gauge of the Great Western Railway, although eventually superseded, contributed as much as anything else towards the improvement and development of the locomotive engine by creating the rivalry known as the battle of the gauges, which lasted fully fifteen years, and resulted in the so-called narrow gauge of 4 ft. 8½ in. being generally employed, and even now adopted by the Great Western Railway. During the period in which the battle of the gauges was raging, several remarkable engines were made, mainly with the object of attaining excessive speed, until at last a standard pattern of passenger engine capable of working the ordinary trains of the period became adopted upon each line of railway. After discussing the details of construction from the days of Trevithick, the father of the locomotive, and entering into the comparative merits of six wheels versus four wheels, and the advantages derived from sundry appliances, such as the sandblast, the book terminates somewhat abruptly with a popular description of valve gear.

*Helical Gears.* By A. FOREMAN PATTERN-MAKER. London: Whittaker & Co. 1893. A PRACTICAL book adapted to serve as a easy reference for designing machinery in the drawing



office and to meet the requirements of construction in the pattern shop, the foundry, and the fitting shop. The volume forms an addition to the Specialists' Series, corresponding with Mr. G. R. Bodmer's able work on Hydraulic Motors, previously reviewed in our pages.\* The author prefers to designate himself by his occupation rather than by name, and simply signs the preface with his initials (J. H.), but proves himself to be a thoroughly practical man by his clear descriptions and ample illustrations. In dealing with the development of the helical form of tooth, and the fundamental relationship existing between the true screw or helix and helical gears, the author expresses the opinion that it is difficult to say whether such gears are superior to ordinary gears, in the matter of strength, but that when correctly set, helical gears tend to distribute stresses and to aid smooth running by aiming at a rolling and pressing action without the consequent friction and loss of power introduced by sliding and rubbing. Easy rolling contact is established; one pair of teeth does not quit contact until the contiguous pair are commencing contact; and in this treatise explanatory of workable methods of development of spur and bevel helical wheels, the author has contributed a useful handbook to machinists.

*The Practical Engineer's Pocket-book and Diary.*  
Edited by W. H. FOWLER, Wh.Sc., A.M.I.C.E.  
Manchester: Technical Publishing Company.  
1894.

As a combination of a pocket-diary for the year, with memoranda and tables useful in the shops, this little book, which measures 5½ in. by 3½ in. by ½ in. forms a handy work of reference for daily use. It contains eight pages of a carefully-compiled index, and also some advertisements furnishing the specialties and addresses of well-known firms likely to be of use to the mechanical engineer, while the data contained upon 200 further pages supply exactly the information connected with weights and measures, steam-boilers, engines and their connecting parts, steam-pipes and pressures, wheel-gearing, belt-driving, hydraulics, timber and metal-work, as is required to be furnished by a note-book, few being gifted with a memory sufficiently retentive as not to need such aids to practice.

*The Engineer's Year-Book of Formulae, Rules, Tables, Data, and Memoranda, in Civil, Mechanical, Electrical, Marine, and Mine Engineering.* By H. R. KEMPE, A.M.I.C.E.  
London: Crosby Lockwood & Co. 1894.

This is the first year of publication of this book, which contains an immense amount of information and memoranda on various subjects, but we do not quite understand for what public it is written. It is far too large for a memoranda book, or what is called a pocket-book in the usual sense; and it is hardly, on the other hand, what could be accepted as a permanent book of reference for engineers, as a good deal of the information is rudimentary in character. It may be a useful book for engineering students to keep by them.

*Woodworking Patterns.* By W. NELSON, Organizer, Manual Instruction, Manchester School Board. Drawn in pen-and-ink by HERBERT COLE. London: Chapman & Hall, 1893.

THESE are a series of well-executed drawings showing the position to be assumed, in order to get the best command of the work and of the tools, for planing, sawing, boring, and other operations of joiner's work. In a short and sensible preface the author calls attention to the importance of position, not only in regard to ease in executing the work, but in regard to the sanitary effect on the physique of a good or a bad position. The positions have been drawn partly on the advice of Professor Renshaw, of the Manchester Gymnasium, and Mr. Salamon, tested by observation of the positions naturally assumed by the best workmen in large workshops. The plates are published also in large form, about 3 ft. high, to hang up as object-lessons in technical schools.

*Animals in Ornament.* By G. STURM. London: Hodder Bros. 1894.

THIS is Part I. of a serial publication, to be completed in six parts, containing ornamental designs, or what are called such, in which animals and birds are introduced. The animals are well drawn; as to the "ornament," it is enough to say that it is in German taste, i.e., that it is not what would be accepted in this country

as ornamental design at all in the true sense of the word. English publishers who propose to introduce ornamental designs by foreign artists, would do wisely to make themselves acquainted first with the condition and tendencies of decorative art among the leading English artists. They would then know better than to expect that any value would be attached in England to such work as is illustrated in these plates.

AMONG annual publications we may call attention to "The Year's Art" for 1894 (Virtue & Co.), which is fuller than ever of useful information as to exhibitions, artistic societies and institutions, and records of what has been executed and exhibited during the past year. These volumes will in time form a very valuable mine of information for reference by those engaged on the history of modern art or the biographies of artists. Sprague's "Pocket Diary and Architects' and Surveyors' Memorandum Book" (Sprague & Co.), a very useful one, is re-issued for 1894; also "The Quantity Surveyor's Tables and Diary" (Metchim & Son), which we have noticed in its last year's edition. "Clark's Pocket-Book for Plumbers, Architects, and Sanitary Engineers" (R. J. Bush & Co.), is not an annual publication, but it may be mentioned here as having just been re-issued with additions, in a second edition, and containing a remarkable amount of information compressed into a book 2½ in. long.

#### TRADE NOTICES.

MESSRS. BROAD & CO. send us their prettily-illustrated catalogue of a great variety of stone-ware and terra-cotta goods, including many forms of traps, channels and bends, flooring bricks, chimney-pots, roofing tiles, &c.

MESSRS. W. SUGG & CO. send us their "Gas Engineers' Pocket Almanack and Lighting Table for 1894," which is essentially a very well illustrated catalogue of their branch of work, and forms a *résumé* of various apparatus used in connexion with gas-lighting, which may be useful to architects as well as to the trade. It is in the form of a pocket-book, and pages for monthly memoranda are added.

### Correspondence.

To the Editor of THE BUILDER.

#### BRECHIN CATHEDRAL.

SIR,—I should like, with your permission, to make a few criticisms and suggestions on the description of Brechin Cathedral published in your issue of the 3rd inst.

1. Does the fact that the nave south piers and arcade are slimmer and lighter than the north necessarily mean that they are of later date? It seems to be a common thing that work on the north side of a church should be of a heavier description than that on the south. Amongst other instances of this, Arbuthnot Church and the ruined chapel of Cowie may be mentioned, where, though there is no arcade, there are fewer windows to the north than to the south, and the work is of a somewhat heavier sort. Moreover the details of the south clearestory (of Brechin) are the same as those of the north.

2. The writer of the description seems to have omitted any detailed mention of the clearestory, which, although out of sight under the modern roof, is, I may say from personal observation, certainly worth some notice. There are three single-light windows on each side, each immediately over each pier, not over each bay as is usually the case. Outside they have a plain dripstone and no mouldings, but inside they were perhaps more elaborate, as one can see that the plaster covers a trifol arch. The string-course above is continuous, having a good design, and is exactly like that on the top of the choir walls. The whole is thirteenth-century work.

3. Is it correct to say that the transepts would have blinded a clearestory window on each side? because, if they were no broader than one bay of the arcade, and as the writer of the description says, their wall-heads were no higher than those of the aisles, they would have left the windows on their west side, since the windows, as pointed out above, are over the piers, and not the bays.

4. The middle of the fifteenth century seems at least one hundred years too late for the date of the square tower. Is it not more probable that the base was built (with the capitals in the corners) in the twelfth century, and that the tower and spire were finished with, perhaps, the details of the lower part, and the vaulting altered in the latter part of the fourteenth century? Jervise, too, in his "Memorials of Angus and Mearns" (vol. i, p. 180), while admitting that the date is not known, supposes it to be in the time of Bishop Leuchars, 1354-73, and says that:—

"This may be inferred from the fact that an inquiry being made at an after period regarding the non-payment of an annual rent from the Kirk of

Lethnot, which was due to the Cathedral, the debt was declared to have been partly paid by the debtors having given the use of a white horse and cart to lead stones to the building of the belfry of the church." ("Reg. Ep. Brech.", i, p. 74.)

And the same place is also mentioned in the same way.

"Doubtless also at the same time the spire had been placed on the Round Tower."

The details, too, seem to belong to this date, especially the belfry window and the carving under the broaches.

5. I failed to notice in your article any mention of the rather curious stone roof-loft arrangement of the choir arch, which seems to be worthy of a short description, inasmuch as it is, perhaps, another instance of the same arrangement as at Dunblane. There was here then a plain low arch below, of which the exact character cannot now be ascertained, and above this on the nave side there was a string-course, over which is a large arched recess which had a blank wall, and was probably a roof-loft, or, at any rate, had a wooden gallery in front of it used for the purpose of one. Access to this was probably obtained by a small doorway in the centre, the outline of which can still be distinguished on the east side. This, possibly, led over the choir roof to some newel stair case in the wall of one of the transepts.

6. Of the bells, two were simply for the chiming, and are by Mears, and of this century; the other—the bell proper—is by Puck and Chapman, and dated from the end of the last century.

7. Jervise ("Memorials of Angus and Mearns," vol. ii, p. 307) says there were over eleven altars, and gives their dedications, and cites as authorities several old records of bequests, &c., by people in the neighbourhood. Is there any other authority who says there were so many? "MOINROS."

Besides the thinness of the south pier compared with those of the north wall, it is to be noted that they are alike, and without the variety of those opposite, thus showing a difference that may better, it is submitted, be accounted for by supposing a lapse of time between the erection of the arcades, than by assuming an unusual freedom in design. Both clearestories are alike in their detail, so, presumably, are of the same date, the suggested renewal of the piers under one wall notwithstanding. The windows, as at Iona, are over the piers, but the recollection of the writer is that the west ones were interfered with by the transept roof. It is certain that the transept roof is of the tower with the capitals at the vault-springing within. The former can hardly be much earlier than the date first suggested, if confirmation is to be taken from a similar profile at Dunkeld, so the capitals may be survivals of an earlier type or parts re-erected. As to the reference to Lethnot by Kirk, noted by the writer, it is not its importance over-estimated? The application is indefinite, and may refer to either round tower or to steeple. The lucarnes of the round tower have, it is true, the same termination of inclined slabs as those of the steeple, and yet may not be contemporaneous, but rather copies, and of a date that may apply to the corbels under the tower, and more like the "baronial type" than the Mediaeval. The recess over the chancel arch may have been utilised in some way as a roof-screen gallery, though, in position, it differs considerably from that at Dunblane, for it is above the clearestory windows, and not opening into the choir, must have been in the cloister. The more correct solution of some important questions. The possibly after all account for the presence of this plain semi-circular arch. The bells were believed to be of the age stated, though re-cast; the number of the altars is given on Walcott's authority.

#### "PARTY WALLS AND PARTY STRUCTURES."

SIR,—I have read with much interest your report of Mr. Woodthorpe's paper on this subject recently read before the Architectural Association, and I notice that while drawing attention to many useful points, the paper, with the discussion following it, leaves us as much perplexed as ever as to the correct solution of some important questions. There is no reflection upon either the paper or the discussion, but it emphasises the uncertainty frequently experienced in building as to what was and what will not be held correct under the terms of the existing Acts, and thus, although questions may be arranged as between the building and adjoining owners, the District Surveyor might subsequently take a different view and reopen them.

For instance, Mr. Woodthorpe says to accept the ruling in "Weston v. Arnold" as an answer to the question whether the upper portion of a wall between a high and a low building is to be regarded as a party wall under the Act. Another may take his stand upon Sec. XVII. of the Act itself, and arrive at a opposite conclusion.

Again, in the question of "party floors" Mr. Woodthorpe and Mr. Blashill appear to be of opposite opinions, so the existing Act is found to bristle with debatable points on important matters, and the consequent difference of opinion amongst District Surveyors is to the proper application of the terms only adds to the difficulty and uncertainty with which the architect is confronted.

Let us hope for a good time coming under the new Act! WM. H. ATKIN BERRY.

\* The Builder, Vol. LVII, pp. r66-r85.



## THE LAST DISCUSSION AT THE INSTITUTE.

SIR,—With reference to the report you have published in your number of the 17th inst. of the Royal Institute of British Architects' meetings, you have attributed some remarks to me in the discussion of the London Streets and Buildings Bill which I did not make, though I joined in the discussion. Your reporter appears to have tacked on to me a speech made by somebody else.

A. PAYNE.

\* We regret the mistake: a great many speakers made brief remarks in rather quick succession, and the reporters had occasionally some difficulty in identifying them.

## The Student's Column.

## THE STRUCTURE AND PHYSICAL PROPERTIES OF BUILDING STONES.—VIII.

## ELASTICITY.

THE elasticity of building stone is a property dependent on the amorphous character, state of crystallisation of its constituent minerals or particles, the nature of the matrix or cementing material (if any), on the elasticity of the minerals concerned, and especially on their mode of arrangement in the stone. In no one rock are all these characters present, and it would be difficult in a few words to select types of stone in which any one of them, or a combination, occur.

The most flexible stone in existence is the so-called "flexible sandstone," or talcolomite, which is found in South-Eastern United States and in Brazil. In reality, it is a schistose crystalline, in which the quartz granules are separated by fine scales of mica, talc, &c. The latter are more or less pliable, and owing to their peculiar mode of arrangement with reference to the other minerals of the stone, slabs of the material bend with facility. An excellent example of it exists in the Museum of Practical Geology, Farnham-street. That, however, is a petrological curiosity having very little reference to ordinary building sandstone.

Nevertheless, all building stones are, to a certain extent, elastic. The determination of this property is one of some difficulty, however, by reason of the smallness of the specimens experimented upon, and the minuteness of the movements to be recorded. Our knowledge of the subject is mainly due to the researches of German experimenters, foremost amongst whom may be mentioned Professor Bauschinger.\* In the United States Mr. T. H. Johnson† and Mr. M. Merriman‡ have, to some extent, dealt with the matter; whilst the only systematic attempt to ascertain the co-efficients of elasticity for British building stone, of which we are aware, is that of Professor Hudson Beare.§ Professor Unwin, however, seems to have made some independent experiments, with a view apparently of checking results arrived at in Germany; and spasmodic records relating to certain stones exist. Stone has no limit of elasticity; it takes permanent sets with very small loads, and the deformation does not increase at first proportionally to the loads and afterwards deviate from proportionality. Professor Unwin remarks that for very hard and dense stone, the compressions and extensions are indeed initially nearly proportional to the loads, but this remains so up to the breaking stress. For all others, especially for the weaker stones, the greatest departure from proportionality is for the smaller stresses. The greater the loads the more do the deformations approach to proportionality. For sandstone and the softer kinds of granite, the compressions increase first more quickly than the loads and afterwards less rapidly.

Professor Bauschinger, in his 1884 experiments, found, for the hardest stone, and especially limestone, that the co-efficient of elasticity was nearly constant, equal for tension and compression, and very large. For most other stone the co-efficient of elasticity for tension diminishes with increasing loads. For pressure it sometimes increases with increasing loads, but for the weaker kinds it diminishes at first, and then increases.

Mr. T. H. Johnson has shown that the elastic properties of some Indiana limestones were very materially influenced by artificial treatment, according as the specimens operated upon were too-dressed or sawn, resulting in favour of the latter. Professor Bauschinger is also led to the

conclusion that by dressing test blocks with hammer and chisel, the results of experiments on elasticity are considerably modified.

The co-efficients of elasticity for pressure alluded to as having been ascertained by Professor Beare are undoubtedly of great value, and constitute a distinct advance in our knowledge of this branch of the physical properties of building stones. Recognising the great difficulty of measuring the minute movements, he requested his assistant, Mr. A. G. Ashcroft, to devise new gear for that purpose, capable of magnifying about 2,500 times. The essentials were that the gear was to be very sensitive, and free from all inertia and resultant backlash. It is sufficiently described and illustrated by the author; and we need do no more than summarise the results obtained. The mean value of the co-efficient for all the British sandstones dealt with (with one exception) was, for the first test, 108,040 tons per square foot, and for the second test 132,280 tons, or 1,680,600 lbs. and 2,057,700 lbs. per square inch respectively, thus showing that sandstone is, on the average, from fifteen to twenty times as compressible as steel. We refrain from quoting the mean co-efficients of the "magnesian limestones," as we observe that of the four stones included under this head (fig. 7 of the paper referred to), at least two are not magnesian limestones, one being to all intents and purposes a sandstone in which carbonates of lime and magnesia are present in only a secondary degree, the other being a shelly oolite. It may be mentioned, however, that the value for the yellow magnesian limestone came out at 206,100 tons per square foot the first time the load was applied. The mean results of what the author calls "typical oolites" are also marred by the inclusion of such stones as Douling and Ham Hill (fig. 8 of the paper), which, with some others, might have been eliminated and formed into a separate group. However, referring to them all as "limestones" merely, the mean values are 133,530 tons and 150,750 tons per square foot. Finally, the value of the coefficient for British granite is for the first test 479,000 tons and for the second 522,100 tons per square foot; or 7,450,000 lbs. and 8,121,000 lbs. per square inch respectively—about a quarter of the corresponding values for steel.

It is to be hoped that the excellent work accomplished by Professor Beare will be continued by him or followed up by other observers. We are still without adequate information as to the co-efficient of elasticity for tension of slabs of British stone, or as to tensile strength of slabs, although a little has been done in that direction. The importance of the subject is very manifest, especially in regard to slates, steps, and landings. The results arrived at would be of greater value were the engineer to take counsel with a petrologist acquainted with the structure of the building stones experimented upon, who could assist him in their proper classification, and explain many apparent anomalies in regard to their behaviour when in the hands of the experimenter. The pieces of stone used in testing are usually small, as previously mentioned—often only 2-in. cubes—and in arriving at the elasticity of such stones as coarse-grained granites with such pieces the observer is often at a discount. Many felspars, especially in certain varieties of Cornish granite, are from 1 in. to 2 in. in length, and in testing 2 in. cubes of these the experimenter is, practically, only ascertaining the elasticity of orthoclase felspar, instead of that of the rock as a whole. It is conceivable, from the arrangement of mica in certain flagstones, and in some foliated crystalline rocks, that they may exhibit the property of elasticity in a much greater degree than some other stones of even the same approximate mineral composition.

Another point to which attention might profitably be directed is as to whether stone suffers any "fatigue" (in the engineer's sense) from repetition of stress, and if so, which kinds are least affected. The outcome of inquiries on this head might lead to the better selection of stone for bridges and viaducts. Does the vibration in stone walls, caused by the movement of machinery, modify the internal structure of the material, and detract from its value?

## ABRASION.

The resistance of stone to abrasion may be considered from three points of view; abrasion produced (1) by the action of heavy traffic over roads paved with the material; (2) by wear on pavements, steps, and landings; and (3) by the propulsion of sand against the walls of buildings by the force of the wind.

Taking the last first, it may be doubted whether

the mechanical action alluded to is a very important factor in relation to the building stones of the United Kingdom, though in populous cities exterior ornament is frequently disfigured by the lodgment of wind-blown dung-dust and other deleterious matter, which have some influence, chemically, in causing the stone to decay; with that, however, we have nothing to do in the present series. In some parts of the world, as in the United States, abrasion by wind-blown sand seems to be of importance. Professor Egleston has placed it on record\* that the effects of this abrasive action can be seen in many of the churchyards of New York City, where the stones face the direction of the prevailing winds. In such cases, he states, the stones are sometimes worn very nearly smooth, and are quite illegible from this cause alone. We do not desire to controvert this statement, but we fancy we see a parallel in the appearance of the New York stone alluded to and that of certain London buildings where the use of wood pavements and the like precludes all possibility of the stone having been abraded by wind-blown sand. It must be remembered that the direction of prevailing winds is also that of driving rains. Are not these latter, which lead to decay of the stone, even to putting a partially smooth surface thereon in the operation, more responsible for the illegibility complained of? A much better illustration is that selected by Mr. G. P. Merrill, where he states† that in Eastern United States, as at Cape Cod, Mass., there may frequently be seen window-panes so abraded by blowing sand as to be no longer transparent. There is on exhibition in the National Museum, Washington, a plate of glass formerly a window in the lighthouse at Nauset Beach, Mass., that was so abraded by wind-blown sand during a storm of not more than forty-eight hours' duration as to be no longer serviceable. The grinding is as complete over the entire surface as though done by artificial means. The surrounding building stone must naturally have suffered also.

The abrading and polishing effects of wind-blown sand have long been noticed on Egyptian monuments exposed to sand-drift from the Libyan desert.

The wearing of pavements, steps, and landings is well understood; but stone for street pavements is not always selected with reference to its wear alone; other things have also to be considered. The stone must be able to resist the wearing action without becoming slippery, and must be strong; moreover, it should wear evenly, and not so as to produce slight depressions, which form convenient receptacles for rain; whilst the more porous it is the sooner the surface will dry after a shower. Some of the Carboniferous sandstones of Yorkshire and elsewhere comply with most of these qualifications.

For roadways subject to heavy traffic it may be doubted whether any material is more durable than certain varieties of granite; but here, again, other things have also to be taken into account—at any rate, in some districts. The noise made by traffic and the uneven surface produced by the continual re-laying of the sets are, perhaps, the chief grievances against the employment of granite for road-paving. It has been remarked, however, that, when evenly laid, traction upon it is easier than on wood, and when properly selected wears with a tolerably rough surface. Granite sets undoubtedly make noisy streets, and on this account alone we should be sorry to pose as apologists for the use of the material for street-making in general; but it should be borne in mind that the noise arises from the constant concussion on the rough uneven surface of the partially-dressed sets, and on the sides of the wide joints with which they are usually laid. If the sets were axed so as to produce an even surface, and laid with closer joints, the noise would be materially minimised, and if a medium-grained stone were used it should not become slippery.

To give some idea of the resistance of granite to abrasion we may quote the following from observations by Mr. Redman,‡ having reference to the comparative wear of granites along a tramway for heavy goods leading to the West India Docks, London. One half of the tramway was formed of Aberdeen granite, one fourth of Guernsey, and one fourth of Herra. The entire length was two miles. The practice had been to use very heavy stones bedded only on gravel; the original depth having been 12 in. It was ascertained that during half-a-century's wear, with a traffic amounting in the last year to 300,000 tons, the Guernsey stone had only been reduced to 10

\* *American Architect*, 1885, p. 13.† *Stones for Building and Decoration*, 1891, p. 357.‡ *Min. Proc. Inst. C.E.*, Vol. lviii. (1879), p. 52.\* *Über den Elastizitäts-Modul Bausteine*. Mitth. aus den Mec. Tech. Laboratorium in München, 1875.† *Report of State Geologist of Indiana*, 1881, p. 45.‡ *Stone* (Indianapolis), vol. vi. (1892), pp. 135-136.§ *Min. Proc. Inst. C.E.*, vol. cvii. (1892) pp. 351 et seq.

The Testing of Materials of Construction, 1886, p. 439.



in. in thickness, the Herm to 9 in., and the Aberdeen to 6 in. Mr. J. Mowlem Burt has remarked \* that of the granite sets 3 in. wide and 9 in. deep with which old Blackfriars Bridge was paved in 1840, the Guernsey stones were 8½ in. in thickness, and the Aberdeen 7 in. when the bridge was pulled down about thirty years afterwards.

Methods imitating the wearing action to which paving sets, &c., are subjected, have been devised in France and Germany, where some English stones have also been experimented upon. We remember seeing some results at the last Paris Exhibition. Professor Unwin says (*Op. cit.*, p. 429) that "the only method of satisfactorily testing the resistance of stone to wear is one devised by Bauschinger. A block of the stone with a face 4 by 4 in. is placed on a horizontally-revolving cast-iron plate at a radius of 18 in. The conditions are found to be most constant when the block is loaded with 66 to 68 lbs. Emery is regularly supplied between the blocks and plate, and cleaned off. The best rate of supply is 20 grams for each ten turns." It does not seem to us, however, that mere rate of grinding is a sufficient test in itself; neither brittleness of the material, nor its strength, nor its relative durability, nor its method of wearing even or otherwise, can be ascertained by the grinding process alone. Clearly there is room here for the introduction of improved methods of experimenting.

#### GENERAL BUILDING NEWS.

**CO-OPERATIVE BUILDINGS, PLYMOUTH.** The Plymouth Co-operative and Industrial Society opened a few days ago their new Central Building. The buildings are situated at the corner of Frankfort and Courtney-streets. The architect is Mr. H. J. Snell. On the ground floor there are seven shops to accommodate the various departments of the Society's work. On the first floor there is a general office, and strong-room, managers', treasurer's, and telephone offices, and mantle, millinery, and furnishing show-rooms. The feature of the second floor is the grand hall, which provides seating accommodation for over 1,000 persons, and which can be utilised as a ballroom and for concert and other entertainments. There is also adjoining a general committee room, a check office, and an ante-room. The workrooms for tailors, dress-makers, and milliners are on the third floor. Dining-rooms for the work-people, and some other offices, and caretaker's apartments occupy the floor above. All the staircases are fireproof. A tower surmounts the edifice, and it is occupied by a turret clock with Westminster chimes.

**MISSION CHURCH, SWALLOWELL, DURHAM.** A new Mission Church has just been opened at Swallowell. It is built of freestone, and will hold 300 people. The seats are of pine, stained and polished. The architects are Messrs. Hicks & Charlewood, Newcastle; the various contractors being as follows:—Mason work, Mr. Wm. Collin, Whickham; joinery, Mr. Jas. Shield, Swallowell; slating, Messrs. Kirk & Dickinson; painting, Mr. Wm. Smith, Winton.

**PRESBYTERIAN CHURCH, BELFAST.** The foundation-stone has just been laid of the Maory Memorial Church, Dunearn Gardens, Belfast. The church is situated with its front to Dunearn Gardens and its side to Edingham-street, and is 69 ft. long by 52 ft. wide in clear. The entrance porches are at either side of the Gardens front, and admit to the vestibules, from which access is also had to the gallery by stairs. The seating, which will be executed in pitch-pine, is circular on plan, and will extend on the ground floor to the front gable, thus giving an opportunity of introducing light under the front gallery. The gallery runs round three sides of the church, the front portion being circular on plan, and has exits at the rear, as well as at the front. Behind the pulpit is the choir chamber, spanned by a cut stone arch and columns, the front being uniform with that of the gallery. The choir chamber is lit from Hillman-street by a tracery window. The roof is constructionally in three spans, and is supported by an arching of Gothic arches springing from substantial cast-iron columns. The timbers are wrought and open, and will be of pitch-pine, the ceiling being of selected white spruce. The external elevations will be in brick, with red sandstone dressings. The Gardens front is composed of a central gable, flanked by the gallery stair wells, which project, and are gabled to the side elevations. On the ground floor the central gable shows a tier of lancet windows, and the porches project from the flanks; and on the gallery floor is a large triplet window, the flanks having each three lancet windows, the projecting porches. The side walls of the church are dressed into bay, containing "carnet lancet" to each bay. The ventilation will be effected by Tobin inlet tubes and a Boyle's exhaust roof ventilator. The lighting will be by leaded cathedral glass, and by gas pendants hung

from the roof trusses, and standards and brackets to pulpit and side walls. The heating will be by small-bore hot-water apparatus. The church will seat about 900 persons, and cost over 4,000l. It is being erected under the superintendence of the architect, Mr. James Ferguson, Belfast, the contractors being Messrs. Campbell & Lowry.

**SCHOOL BUILDINGS, PENZANCE.** A new school-room, which the Congregationalists of Penzance have erected, was recently opened by Mrs. E. R. Lester. The building, which adjoins the chapel, is 51 ft. in length by 21 ft. in width, and is situated on the south side of the chapel. Mr. Lester is the architect, and Messrs. Perkins, Caldwell, & Caldwell are the contractors.

#### SANITARY AND ENGINEERING NEWS.

**THE SANITARY INSTITUTE CONGRESS.**—The Council of the Sanitary Institute have accepted an invitation received from the Lord Mayor and citizens of Liverpool to hold their next Congress and exhibition in that city in the autumn of this year.

**SEWAGE WORKS, SKELTON AND BROTTON-IN-CLEVELAND.**—The Local Board for this district, under special notice from the Local Government Board, are arranging to carry out a comprehensive Scheme of Outfall Sewers and Disposal-works, for their entire district, embracing a population of about 15,000, and have further instructed Mr. D. Balfour, M. Inst. C.E., F.G.S., of Newcastle-on-Tyne, to forthwith prepare a scheme accordingly, so as to prevent the pollution complained of by the Saltburn Local Board.

**SEWERAGE SCHEME, TIVIDALE, STAFFORDSHIRE.**—At a monthly meeting of the Rowley Regis Local Board, the General Purposes Committee reported that two letters had been received from the Local Government Board, one relating to the sewerage of Tividale, and the other to domestic drainage and the dependence of many houses for their water-supply upon wells exposed to grave risks of contamination. As to the sewerage, the committee instructed the clerk to reply that the Upper Stour Valley Main Sewerage Board had probably by that time made an application for a loan for outfall works for the sewage at Tividale, and as a local inquiry would be held, the committee desired that the Local Government Board would at the same time deal with the scheme for the sewers. The report was adopted. Mr. E. B. Marten afterwards submitted plans of the sewerage scheme for the Tividale district, the estimated cost being 3,700l. The scheme was adopted, and it was decided to apply to the Local Government Board for a loan of 4,000l.

**SEWAGE OUTFALL WORKS, MILTON MOWBRAY.**—The Melton Mowbray Local Board have adopted the international system for their new sewage outfall works, and have instructed Mr. Jeeves, their surveyor, to prepare the necessary plans for the Local Government Board.

#### FOREIGN AND COLONIAL.

**FRANCE.**—An exhibition of water-colours by Dutch artists, numbering about 20 drawings, has been opened at the Goupil Galleries. —The Government has commissioned M. Courcelles-Dumont, pupil of Elie Delaunay, to finish, in concert with M. Desvallières, the panel of "Attila," which had been commissioned from Delaunay for the Pantheon and for which he left sketches, which are to be followed in completing the work. —M. Raoul Verlet has been chosen to execute the monument to be erected by public subscription to Guy de Maupassant, in the Parc Monceau. —The monument to Bayre, of which we have already spoken, and which is to be erected at the extremity of the Ile St. Louis, is nearly completed. It is the work of M. Bernier, the architect who obtained the first premium in the Opéra Comique competition. A bronze group, "Theseus overcoming the Minotaur," which is one of the principal works of the great sculptor, is already in its place. —A gale has blown down the statue of Napoleon on the cliffs at Boulogne. The statue was broken in fragments in its fall. —M. Dalou, the sculptor, has just completed the sketch model for the monument in commemoration of the combat of Sidi-Brabim. The monument, intended for the town of Oran, includes a marble obelisk on a richly-decorated pedestal. On the summit is a winged figure of Fame bringing a palm to the soldiers killed in the battle. At the foot of the obelisk is a kneeling figure of France, holding a flag in her left hand while with her right she inscribes the names of the subjects of the memorial. The total height of the monument is 15 metres; the base, decorated with trophies of arms, being surrounded by cannons united by heavy chains. —On Tuesday last the Fine Art Exhibition at Lyons was opened in Bellecour Pavillon. —On June 15 an exhibition of decorative art is to be opened at Nancy, to remain open for a month. —The death is announced of the landscape painter Etienne Bracony, who figured in the Salons of 1847 and 1855. He painted principally views in the Forest

of Fontainebleau. —The sculptor Jacques Mallet has died at the age of seventy-one. A former pupil of Pradier, he obtained the Prix de Rome in 1847; a medal of the first class was awarded him by the Legion of Honour in 1878. It was he who, after the Commune, was entrusted with the restoration of the Vendôme Column. —The congress of French architects will be held this year at Lyons, from the 10th to the 13th of June inclusive. The members of the congress will visit the town of Bourg-en-Bresse. —The Société Académique d'Architecture de Lyon has awarded to M. Claude Garnier the first prize in the competition which it organises every year. The subject was "Un Pont de la Croix Rousse Fourvières." MM. Alexandre Faure and Paul Bruyas obtained the second prize *ex æquo*, and M. Armbruster the third. M. Mérieux obtained the first prize in the architectural competition, the subject of which was a monograph of the church of Ainay. —The Railway Company de l'Ouest has just made a trial, on the line from Havre to Beuzeville, of the first large electric locomotive constructed by M. Heilmann, a French engineer, who promises to obtain with these engines a speed of 120 kilometres per hour. Among the numerous schemes for an exhibition palace, which will be submitted to the organisers of the 1900 Exhibition, there is one which is already much spoken of in the French press, and which M. Hector Horeau, the architect, proposed for the 1881 Exhibition in London. He proposes a palace surrounding a grand square with the floor area of its centre. It would give double the floor area of the existing constructions around the Champ de Mars, and render unnecessary the addition of annexes and the bridging of the Seine with a temporary flooring. There is some talk of adopting this. It seems to us better that the general committee should keep to its original intention of a grand competition, which might bring out some really new and original idea. The public, after the variety and picturesque effect of the collection of buildings for the 1889 Exhibition, would find this single grand square of glass and iron buildings, surrounding the whole of the Champ de Mars, rather monotonous and uninteresting.

**GERMANY.**—The Emperor announces that he will henceforth give from his privy purse an annual prize of 500l. for the encouragement of the study of classic art in Germany. The subject to be set for the first competition is the restoration of the Pergamene woman's head, at present in the Berlin Museum. —The Prince of Stolberg-Wernigerode is engaged in forming a museum for the antiquities and archaeological relics of the Harz at Wernigerode, the feature of which will be his own collections. —Architecture will probably be well represented at this year's Berlin Art Exhibition, the executive committee having decided to place one of the large halls in the central nave of the building at the disposal of the Berlin Architectural Societies. —The plans for the proposed Berlin "Permanent Fair" building are now ready. The scheme includes a large hotel in the Alexandrinenstrasse, together with consignment offices, whilst the main building is to be on the Ritterstrasse, and contains the extensive show-rooms, with spacious cellars for storage purposes. Room is to be found in the upper stories of a part of the building for some additional premises required for the Municipal Technical School. It has been decided to hold a competition for the plans of a new school and gymnasium at Altona, to cost about 12,000l. —Competitions are also announced for the plans of new evangelical churches at Magdeburg (to seat 900, at a cost of 10,000l.), and at Carlsruhe, in Baden (to cost 22,500l.), with a seating capacity of 1,200. In both instances the amount named is to include all fittings. —Rostock is to have a new theatre, at a cost of 21,500l., containing accommodation for 1,200 playgoers. The architect is Mr. H. Seeling, of Berlin, who was the winner of a limited competition lately opened for the design. —The Town Council of Mayence have resolved that the holding of a technical post under the Government is a sufficient qualification for the post of mayor of that town. Under these circumstances two architects will be candidates for the post, which is vacant. This is the first instance in Germany where other than lawyers or merchants have been admitted to the competition. —The Prussian Diet will be asked to sanction a grant of 375,000l., being a third of the estimated cost of the proposed canal from Lauenburg on the Elbe to Lubeck. By the operation of this scheme the produce of the Prussian territories adjacent to the Elbe will gain easy access to the Baltic, and thus to Scandinavia. —In the course of a lecture delivered at the Railway Institute will be asked to sanction a grant of 375,000l., being a third of the estimated cost of the proposed canal from Lauenburg on the Elbe to Lubeck. 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## MISCELLANEOUS.

**THE TOWER BRIDGE.**—A lecture was delivered at the Victoria Music Hall on Tuesday night, as one of the Penny Science Lectures, by Mr. Wolfe-Barry, C.E., on "London Bridges," the chair being occupied by the Hon. Richard Grosvenor. The early part of the lecture, which was illustrated by a large number of lantern views, was historical, the various bridges across the Thames being described and illustrated. Until 1759, when the old wooden bridge of Putney was built at the modest cost of 23,750*l.*, only London Bridge spanned the Thames, but this being always constructed of wood, until the present century, had to be renewed every 100 or 150 years. The existing London Bridge, built 1824-31, was the first stone bridge over the Thames. The Tower Bridge was suggested by the late Sir Horace Jones, the City Architect, and it had been constructed solely at the expense of the Corporation of London, at a cost exceeding a million pounds sterling, towards which the ratepayers of the metropolis had not been called upon to contribute a penny. In its construction, more than 12,000 tons of iron and steel have been used. The opening of 200 ft. was the greatest hitherto attempted, and in many other respects the problem involved unusual difficulties. The passing of sea-going vessels, which averaged seventeen daily, had to be provided for, and for that purpose a clear space of 135 ft. between high-water mark and the underside of the upper roadway had been obtained. The time would probably come when sea-going vessels would not require to proceed beyond the bridge, and it would then become a fixed bridge with 29 ft. of head-room above Trinity high-water mark.

**CITY COMMISSION OF SEWERS AND CHRIST'S HOSPITAL.**—A meeting of the City Commission of Sewers was held on Tuesday at the Guildhall, Mr. J. C. Bell, the chairman, presiding. It was decided to authorise the Sanitary Committee to conclude arrangements with the almoners of Christ's Hospital for the carrying out of a modified scheme of sanitary reform at the school. The almoners will at once ask the consent of the Charity Commissioners to the outlay, and if this is obtained the work will be proceeded with as speedily as possible, and a large number of the boys will return to their old school as soon as the scheme has been carried into execution. On the recommendation of the Finance and Improvement Committee, the court resolved to take steps to oppose the London Streets and Buildings Bill, the Central London Railway (Extension of Time) Bill, and the London County Council (General Powers) Bill, with a view to obtain a *voies stants*, and to protect the interests of the Commission. It was decided to pay 8,152*l.* in respect of the widening of Fenchurch-street by the setting back of four premises. A letter was read from the London County Council stating that it had been determined, in future, before changing the name of any street, to give one calendar month's notice to the inhabitants. To this the Commission offered no objection. Replying to Mr. G. N. Johnson, Mr. Burnester, Chairman of the Streets Committee, said the gas-lamps would be entirely removed from the streets of the City by the end of March. At the instance of Mr. Pierce Morrison, it was referred to the Streets Committee to ascertain if the constant repairs necessary to the street pavements of the City might not be done at night instead of at day as at present.

**ANNUAL DINNER, HULL MASTER BUILDERS' ASSOCIATION.**—The annual dinner of the Hull Master Builders' Association was held at the Grosvenor Hotel on the 19th inst., the President (Councillor Skinner) occupying the chair. After the usual loyal and patriotic toasts had been proposed and honoured, Mr. T. Liggins proposed "The Mayor and Corporation." The Mayor, in responding, said they had had in the Corporation during the past year many schemes and objects under consideration. With reference to the battle of the plans, he was glad to hear that the Corporation had done well in passing the by-laws respecting building regulations. The ratepayers of the town had now accepted the Public Libraries Act, and it was thought that a large Public Hall, which would include all the buildings and requirements of the town, was wanted. The town presented a very attractive appearance, and many of the shops of Hull were simply houses altered into shops. Standing on the Whitefriargate Bridge they got a unique view—a most Continental one. And yet the town was a good business town, and what was wanted were larger and more commodious blocks of buildings suitable for business purposes. Mr. W. S. Lockridge proposed "The Hull Master Builders' Association." The President, in acknowledging the toast, said—They had now inaugurated and established a local habitation, known as the Builders' Exchange. He would tell them what they intended to do in it. Those whom they did their business with—bricklayers, slaters, stonemasons, &c., would use it with them, and so be enabled to do their business transactions under comfortable conditions. Literature suitable to the trade would be placed upon the tables, and such information as would guide them in their purchases would be at command. He hoped that the new Exchange would become a power in Hull and assist them in their good relations one with another. With reference to the labour question, the labour market was still

in a state of ferment, but they hoped, so far as Hull was concerned, that masters would have very little anxiety. Mr. E. Good next proposed the toast of "The Architects." Mr. Bilson, in replying, bore witness to the good feeling between the architects and the builders. Other toasts followed.

**A NEW RADIATOR.**—A good form of radiator for heating by steam or hot water has been recently patented by Messrs. Parsons & Harris, of 17 and 18, Sidney-grove, Goswell-road, in which, by enclosing, as it were, one radiator within another, a very large amount of heating surface for contact with the air is provided, and in this way the chance of the air becoming scorched is materially lessened. The design is of an entirely unoffensive character, hence the necessity for coil cases is obviated. The air passages are easily cleaned, and the surfaces are, moreover, so arranged that very little lodgment for dust is provided, so that the air is kept free from the pollution so often resulting from such apparatus. The prices are kept low, whilst the workmanship appears to be of good quality.

**LONDON STREETS AND BUILDINGS BILL.**—The following is a copy of a resolution passed at a meeting held at Stepney on the 19th inst. After hearing the last of two lectures on Light, Air, and Space, from Mr. R. Williams, architect, the following resolution was moved by Mr. A. Crow, F.R.I.B.A., and seconded by Mr. T. Reynolds:—That this meeting of inhabitants of Stepney rejoices to learn that the London County Council is promoting a Bill in Parliament under the title of the London Streets and Buildings Bill, having for its object the securing of more light, air, and space round buildings and earnestly trusts that the Bill may become law.

## LEGAL.

## PARTY WALL AND LIGHT AND AIR CASE.

MESSRS. BOOKER & WARNE, licensed victuallers, were pulling down some time ago "The Daisy" public house, Brompton-road, and gave notice of their intention to remove the party-wall between their premises and those of the adjoining owner, Mr. Burkett, a butcher. They intended rebuilding the wall, and raising it to a greater height. Plaintiff claimed an injunction in the Chancery Division, and by consent all questions including light and air were referred for arbitration to Mr. Thomas Batterbury, F.S.I., A.R.I.B.A., District Surveyor of Eltham, and Plumstead, 20, John-street, Bedford Row sole umpire. Plaintiff claimed damages for disturbance in his business, including the expenses of his manager and family living away from the premises, which he contended were necessarily incurred, and *sol.*, fees of his surveyor, Mr. Stephens, in relation to the party-wall. Mr. C. W. Stephens and Mr. Walter T. Fairthing, surveyors, gave evidence on behalf of the plaintiff. Mr. Richardson, for the defendants, contended that the party wall was unfit for the purpose of supporting any new building, and that the expense of pulling down and rebuilding the wall should be borne by the building owner and adjoining owner in due proportion under Section 88 of the Metropolitan Building Act of 1855. Plaintiff he urged, was not entitled under the Act to any compensation for disturbance, nor to his surveyor's fees; and he declared that the shoring and screening which defendants had done was sufficient. With regard to the question of light and air, both parties placed a statement of law before the arbitrator, who examined the witnesses and inspected the premises. Mr. Batterbury, as umpire, gave his award finding that the party wall was not suitable for the erection of new buildings adjoining it, and that it must be pulled down. The expense of pulling down and rebuilding, he determined, must be borne by the building owners (Messrs. Booker & Warne), but if the adjoining owner subsequently made use of the extra height to which the wall was raised, he was to pay his proportion in respect thereof. The arbitrator further found that the plaintiff's claim to rights of light and air in relation to the premises was unfounded, and must be dismissed, as also were the claims for compensation for disturbance and surveyor's fees. The costs of the proceedings before the arbitrator, as well as in the Court, were ordered to be paid by plaintiff.

## IMPORTANT POINT UNDER THE METROPOLITAN BUILDING ACT, 1855.

THE case of Holland and Another *v.* Wallen, on Monday and Tuesday last came before a Divisional Court of Queen's Bench, consisting of Mr. Justice Mathew and Mr. Justice Cave, it being an appeal by Messrs. Shoobred & Co., of Tottenham-court-road, from an order of Mr. Vaughan, Metropolitan Police Magistrate, directing them to comply with an order made by Mr. F. Wallen, the Surveyor for the District of St. Pancras West, under the Metropolitan Buildings Act, 1855. The facts were shortly as follows:—In March, 1892, Messrs. Holland & Hannen, the builders, the appellants, gave the respondent notice of their intention to erect certain new premises in Grafton-street, and such works were duly commenced. In the August following the respondent served a notice on the appellants calling upon them

to divide their new premises by party-walls in such a manner that the contents of each division should not exceed 216,000 cubic feet. The appellants did not comply with the notice, and then they were accordingly summoned for an offence under Rule 4 of Section 27 of the Metropolitan Buildings Act, 1855, which provides that "every warehouse or other building used either wholly or in part for the purposes of trade or manufacture, containing more than 216,000 cubic feet, shall be divided by party-walls in such manner that the contents of each division thereof shall not exceed the above-mentioned number of cubic feet." When the summons came on for hearing it was proved that the building, which consisted of eight floors, was 87 feet in height, and that it was contiguous to and intended to form an extension of the premises of Messrs. Shoobred in Grafton-street. The basement of the new building, when it was completed, was to be used for packing goods, the ground floor as a retail shop for the sale of goods, and the floors above as dining-rooms, kitchen, &c. The floor which supported the kitchen had iron beams with steel cross beams, and was filled in with concrete. There was a staircase leading from Grafton-street to the top of the new building, and on each floor there was a fireproof landing from which there was a landing to the several floors. The cubical contents of the whole building were 289,456 ft.<sup>3</sup>, inclusive of the staircase, which was 16,456 ft.<sup>3</sup>, the contents of the premises above the concrete floor being 62,087 cubic ft. The magistrate (Mr. Vaughan) held that the building in question was a building to be used in part for the purposes of trade, and that it was not divided by a party wall, so as to bring each division within the prescribed limit of 216,000 cubic ft., the concrete floor which separated the two upper floors from those below not being in accordance with the statutory requirements of a party-wall. The questions for the opinion of the Court were whether the building was a warehouse or other building used either wholly or in part for the purposes of trade or manufacture, and whether the concrete floor which separated the two upper floors from the lower floors of the building was a party-wall within the meaning of the statute.

Mr. Finlay, Q.C., and Mr. Grain appeared as counsel for the appellants, and Mr. Cripps, Q.C., and Mr. Daldy for the respondents.

Mr. Finlay contended that the building was not a warehouse or other building used wholly or in part for the purposes of trade or manufacture within the meaning of the Act, and that the words "other building used either wholly or in part for the purposes of trade or manufacture" referred to other buildings *quidam generis* with warehouse, and that that was the interpretation the rule ought to bear in law. He also contended that the concrete floor was a party wall, and that the divisions of the building above and below the floor did not separately contain more than 216,000 cubic feet, and that therefore the statute had been complied with.

Their Lordships, at the conclusion of the arguments, upheld the decision of the Magistrate, and dismissed the appeal with costs.

## CAPITAL AND LABOUR.

**BUILDING TRADE DISPUTES DURING JANUARY.**—According to the *Labour Gazette* there were nine disputes in the building trade during the month of January, five of which were due to differences with respect to trade rules and customs, and three to questions of unionism. A satisfactory settlement has been arrived at with regard to five of the disputes, and of those which still contend the one affecting the South Shields bricklayers and labourers is the most important. The dispute, which commenced on January 1, affects twenty firms, and arose out of a refusal of the men to accept a new code of working rules put forward by the employers. The approximate number of persons on strike or locked out is 136. The other unsettled disputes are at Dunce (slaters), Newcastle-on-Tyne (plasterers and labourers), and bricklayers and labourers.

## MEETINGS.

FRIDAY, FEBRUARY 23.

*Sanitary Institute (Lectures for Sanitary Officers).*—Mr. W. C. Lyndale on "House Drainage." 8 p.m.  
*Institution of Civil Engineers.*—Students' visit to the Paper Mills of Messrs. Joynton & Son at St. Mary Cray. 2 p.m.

SATURDAY, FEBRUARY 24.

*Royal Institute of British Architects.*—Visit to St. Paul's Cathedral to inspect the new mosaics.  
*Architects' Association.*—Visit to the Battersea Town Hall by permission of the Architect, Mr. E. W. Mountford. 3 p.m.  
*Junior Engineering Society.*—Visit to the Tottenham and Forest Gate Railway Works. 3 p.m.  
*Royal Institution.*—Lord Rayleigh on "Light, with Special Reference to the Optical Discoveries of Newton." 111. 3 p.m.  
*Edinburgh Architectural Association.*—Visit to Craig-house.  
*Queen's College, Cork.*—Mr. Arthur Hill on "The History of Architecture."—VII. 3 p.m.

MONDAY, FEBRUARY 26.

*Royal Institute of British Architects.*—Papers by Professor T. Roger Smith, Professor J. A. Fleming, M.A., D.Sc., Professor G. Carey Foster, F.R.S., and Professor T. Hudson Bear, B.Sc., M.Inst.C.E., on "The











47 and 49, ST. ENOCH-SQUARE

# The Builder.

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MARCH 3, 1894.

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Vendramini Palace, Venice.—Illustrating Professor Aitchison's Royal Academy Lectures.....	Double-Page Ink-Photo.
Some Renaissance Palaces.—Illustrating Professor Aitchison's Royal Academy Lectures.....	Double-Page Ink-Photo.

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### Philæ and the Reservoir.



**PROPOSAL** to form a large reservoir in Egypt by damming up the flood water of the Nile, and thereby securing a plentiful supply of irrigation water all the year round, is in itself a matter of sufficient

importance both in an engineering and in an economic point of view to be well worth the attention of the public generally as well as engineers. It is doubtful, however, whether it would have attracted any great amount of public attention in this country had not been for the fact that the scheme most warmly favoured by the engineers and others who are promoting it involves the destruction of one of the most widely-known and admired relics of ancient architecture, and one of the most picturesque places in the world. There is a sort of fascination about the very name Philæ; it has a kind of sacred sound in the ears of all artists and lovers of art. Such is the disproportion between material and mental interests, that the scale of the engineering operations proposed, and the economic benefits to be obtained from it, appear to a large portion of the world matters of secondary interest compared with the fact that the destruction of Philæ is to be the price of these practical gains. Of course, allowance must be made for the difference between personal interest in the matter. The inhabitants of countries or cities which are famed for the beauty or interest of their architectural remains mostly care little for these. They have lived among the ruins for centuries, and regard them as common and every-day facts, to be looked at only in the light of their own interests. The Venetian Municipality, it has been long understood, would be quite willing, even desirous, to fill up all the smaller canals and turn them into streets for wheeled traffic, if they could raise the funds to do it, in order to render mercantile traffic easier and increase the commercial prosperity of the city. Venice, as we regard it, is nothing to them; it is the place where they live and do their daily business; and they imagine, rightly or wrongly, that waterways are not convenient in

this light. Similarly, it may be presumed, the Egyptians do not care much about Philæ, and would be very ready to sacrifice it for better means of irrigation and a larger annual revenue. On the other hand, the irrigation and the revenue do not very directly affect us; we are only conscious that we are threatened with the loss of something beautiful and of historic interest, which many of us have seen and others wish to see. There is a certain amount of selfishness, on each side, to be allowed for. Before reckoning up the account, and estimating the relative value of the claims of the æsthetic and the engineering party, let us consider what are the actual proposals and alternatives offered by the latter.

The Cairo correspondent of the *Times*, in its issue of the 24th instant, furnishes a description of the main proposals of the undertaking which have lately been investigated by the engineers of the Egyptian Government, having for its principal aim the irrigation of Upper, Middle, and Lower Egypt by means of a gigantic reservoir to be formed by the construction of a high dam across the Nile itself. After four years of study devoted to the subject, the results of which have been embodied in a voluminous report by the Inspector-General of Reservoirs, four different sites have been proposed for the dam between Cairo and Wady-Halfa. There is also a fifth scheme, one that has been for some years strenuously advocated by Mr. Cope Whitehouse, an American gentleman, for converting a huge natural depression which exists in the Fayoum into an enormous lake, having an area of 670 square kilometres, or, roughly, 270 square miles. As that scheme would only serve Lower Egypt, and, at the same time, be more costly than either of the other four, it is not recommended for consideration.

The four alternative sites for the great dam are situated respectively at—1st, Kalabsha, 31 miles above Assouan; 2nd, the south end of the Island of Philæ; 3rd, Assouan itself; and 4th, Silsila, 44 miles lower down the river.

After stating the advantages and drawbacks of each of the four sites, Mr. Wilcocks, the Inspector-General of Reservoirs, gives the preference to that of Assouan; for reasons which, from an engineering point of view alone, appear to be irresistible, and justify the title of "a perfect site for the construc-

tion of a dam;" the conditions being that the bed of the river consists of homogeneous rock of a hard description, while during its low stage the river is split up into several channels, thereby offering great facilities for the diversion of the water during the process of laying the foundation. At the other sites the quality of the rock is said not to be uniform. The site at Assouan has, however, the one drawback (already mentioned), that it would submerge the well-known monuments at Philæ. This may appear to engineers to be a sentimental objection, trivial in comparison with the great national benefit which would be conferred by the construction of the reservoir at this spot. It is, however, hardly to be so dismissed, but we will return to this point further on.

The idea of throwing dams across the Nile for both irrigation and navigation purposes is not new, but has occupied the attention of several engineers in the past. The objections which have been urged by opponents of any dam being raised on the Nile are so trivial as to be scarcely deserving of notice, but they have been courteously and at the same time conclusively answered. Undoubtedly the works proposed are great, but they do not exceed either in difficulty or magnitude similar structures which have been successfully built, and are at the present moment in operation in India. The great dam, a mile in length across the River Godavery at the site of the first barrier, or cataract, as it would be called in Egypt, is one almost exactly similar. The masonry dam, 109 ft. high, forming the great lake near Poona, and a similar in the South of India across the River Perryaur, are both much higher than those proposed for the Nile. The first-named has to bear a much more serious overfall, and to discharge a far greater volume than the Nile carries, so that there is no special engineering difficulty to be overcome at any of the four sites on the Nile, which has not been already encountered in the Indian works. But the estimated cost is very much greater. In the absence of plans, and with only such a summary of information as the *Times* correspondent can give, it is not possible to form more than a very general idea of the engineering features of the scheme, and of the conditions which govern its dimensions, especially that of the dam, viz., 22 metres, or



about 72 feet. It cannot be gathered whether this is the extreme height of the dam at any one part, or its average height throughout its entire length. Of course, the whole question as to the trial it has to sustain during the period of floods depends on the proportion of the river's waterway obstructed by it—unless, indeed, it is intended to serve merely as a retaining dam and not as a weir, and to provide for the whole volume in flood being discharged through the 100 or 120 openings, whose aggregate waterway area is stated to be 2,000 or 2,400 square metres, capable, it is calculated, to pass 10,000 cubic metres per second, with a mean velocity of 5 metres per second, and a head of 2 metres, or  $6\frac{1}{2}$  ft., equivalent in round numbers to a volume of 47 million cubic yds. per hour. But as that discharge is little more than one-fourth of the volume in a high flood of the Ganges and other rivers in India, to which a maximum flood of the Nile probably approaches, the above openings would be insufficient for the discharge of the entire volume in a maximum flood, and, if so, the greater portion would have to flow over the dam itself. Possibly the "head" of 2 metres which is to give the velocity through the sluices represents the depth which it is intended to pass over the dam. This, of course, can only be conjectured, and it is alluded to here only with reference to the strain mentioned above to which, if the dam has to serve as a weir, it will be subjected.

Although the other dimensions are specified, the width of the river and consequent length of the dam is not mentioned, and as nothing is said as to the contents of the reservoir, a rough approximation only can be arrived at as to its capacity from the statement that the dam, if located at Assouan, would hold the water back as far as Korosko, a distance apparently of about 125 miles. If this be correct, the contents when the reservoir is full would probably exceed 1,000 million cubic yards.

But the question arises whether it would not be possible, and, if possible, expedient also, in the interests of navigation, to seek for a site so much higher up the river as would get over the difficulty of passing the Third Cataract, and adapting the main canal from thence to steamer navigation and carrying it past the two lower cataracts, as well as the shoals which may be met with in the low water season.

The dimensions of the main canal to carry the requisite volume for irrigating the immense tract to which it is in contemplation to lead it, must necessarily be very considerable, and so it could be easily adapted for navigation purposes as well.

As the principal object of the scheme is to secure the storage of a portion of the Nile which now flows unutilised to the sea, it is essential to construct a dam of much greater height than would be necessary were the passage of the several cataracts alone to be considered, and therefore where the dam forms so large a portion of the expense (it is estimated at 1½ millions sterling nearly) it may be worthy of consideration whether it would not be advisable to secure the double object of overcoming the difficulties encountered at the cataracts, and providing for the irrigation of the country, by one and the same work, and whether it would not be less expensive to construct a greater length of canal than to multiply the number of weirs with all their attendant works for the passage of the different rapids, as has already been elsewhere mooted. If this alternative be practicable all the objections urged in regard to interference with ancient monuments will be removed, and a still more extended benefit be conferred upon Egypt by the attainment of results similar to those which have been experienced on the frontier of India, where turbulent tribes have been induced to lay aside the sword and forsake their lawless proclivities, and become the peaceful cultivators of tracts which had hitherto lain unproductive solely on account of the insecurity

engendered by the marauding tribes to which they were adjacent.

The grand financial returns which are represented as certain to accrue from the proposals now under consideration would be still further greatly enhanced if the savage tribes in and around the Soudan have the opportunity afforded them of migrating to Egypt and becoming cultivators of the soil, and thus giving that kingdom a secure and peaceful frontier, instead of the continually disturbed conditions which now exist.

Coming now to the question of the claims of Philæ, we may observe in the first place that it is an alarming instance of the manner in which engineering interests are now supposed to override every aesthetic consideration, that a proposal to submerge this island and its remains in a reservoir should be made by engineers in as calm and matter-of-fact a manner as if it were a kind of everyday occurrence. It is true that Mr. Garstin's report on the matter, part of which was read at the meeting of the Society for the Preservation of the Monuments of Ancient Egypt on February 23, was reasonable and moderate in its views; but he is very exceptional among engineers in this respect, and when we are told that it was so admirable on his part to confine himself entirely to the engineering aspect of the matter, we may reply that engineers would command more respect from some people if they showed a little more enlightened interest in ancient works, and a less marked tendency to look at everything in the world from the point of view of their own work only. But the fact seems to be that the majority of engineers are absolutely unable to understand the interest which people of rather wider education and sympathies attach to monuments of architectural beauty and archaeological value. We remember once looking, in company with an engineer, at one of the most beautiful bits of Early English architecture in this country, when our companion inquired, "what it was that we admired in it." We did not attempt to explain, as it would have been obviously useless; but we thought the question very characteristic. The same entire ignorance of the architectural bearing of the subject is shown in the absurd proposition that has been made to spend over 200,000*l.* in taking down the Philæ buildings and erecting them on another island! What do they suppose would be the value of the buildings to architects or archaeologists after that process? As has already been observed elsewhere, they might just as well throw the money into the Nile. And to crown all, "A Civil Engineer" writes to the *Times* to intimate that the island and the temples would be greatly improved by being sunk under water for three-quarters of the year, and that we should be able to study and examine the remains on it with much greater pleasure and satisfaction when the debris had been carried away and "the island would appear clothed with verdure and far more beautiful than it is to-day." Is this intended as a joke? If not, it is certainly a most characteristic specimen of the attitude of the engineering mind.

At the meeting of the "Society for the Preservation of the Monuments of Ancient Egypt," already referred to, the following resolution was put:—

"That the Society for the Preservation of the Monuments of Ancient Egypt have heard with dismay that the project of making a dam above Assouan to form a reservoir of the Nile water, which will entail the submergence of the Island and Temples of Philæ during many months in every year, is about to be considered as one of the schemes which may be recommended for adoption by the Technical Commission recently appointed in Cairo to consider the question.

The destruction of this group of buildings, unique for its beauty and of the highest historical interest, is an event which would be viewed as a disaster by the whole civilised world; and the proposed taking down and reconstruction of the temples on another island, will in no way meet the objections to the scheme.

The Society therefore begs to submit to the Secretary of State for Foreign Affairs that immediate steps should be taken to press for the withdrawal of the project from the consideration of the Technical

Commission, and thus prevent this country being in any way responsible for what would certainly be considered an act of vandalism."

Mr. Statham moved the addition of the following words at the close of the last paragraph but one of the resolution:—

"The buildings will probably be injured in the course of removal, and their historical value will be hopelessly impaired."

With this addition (the last two words of which are perhaps hardly strong enough) the resolution was put to the meeting, and carried unanimously except for the contrary vote of Colonel Scott Moncrieff, Mr. Garstin's predecessor in Egypt, who when in that country was regarded as a very faithful and helpful ally of the Society, but who caused some amusement by now unexpectedly appearing as a kind of Balaam prophesying the reverse way to what was expected from him.

The reason for Colonel Scott Moncrieff's hostile vote was, we understand, that he thought "everything should be threshed out," and this was a resolution for preventing this threshing out, and for taking the scheme which would destroy Philæ out of the category of alternatives for consideration. There is some reason in this; and Lord Carlisle, who was in the chair, frankly admitted that if there were no other possible way of providing the reservoir, Philæ could not be allowed to stand in the way of a great public improvement. Of this there can be no question. The question is, whether it is justifiable to sacrifice Philæ merely because the Assouan position for the proposed dam is the best and most economical from an engineering point of view; and whether something ought not to be sacrificed by forming the reservoir in a less advantageous position for the sake of saving Philæ. If this could be discussed by a committee representing engineering and architectural and historical interests alike, we should be ready to abide by the conclusion of such a committee. But the matter appears to be at present left to the consideration of three eminent engineers, and we fear that eminent engineers will recognise only one side of the question. The "Civil Engineer" who writes to the *Times* admits frankly that "Philæ is the most beautiful spot in Egypt; it seems more like the creation of a painter's fancy than an actual scene;" but this does not the least prevent him from treating with indifference the proposal to submerge it. Sir Benjamin Baker, who represents this country on the Engineering Commission now engaged in reporting on the subject, is a great engineer of whose fame and genius as such we are all proud; but the fact that he has lent himself to the erection of the monstrousity in progress at Wembley Park does not say very much for the acuteness of his aesthetic sensibilities, and that is why we are inclined to support the view that the Philæ scheme should be taken out of the category of alternatives. The engineers are not to be trusted with it; they see only one side of the question. Many of them, we fear, would calmly submerge all the temples in Egypt for the sake of a better irrigation scheme; and when we hear of all the advantages offered by the submergence of Philæ, we are inclined to doubt whether this is only the thin end of the wedge, and to say, *Timeo Danaos et dona ferentes*.

#### NOTES.

THE attitude of the County Council in regard to the London water supply question, as defined at their last meeting, is so far in the right direction. The Council has refused to regard the position in which the matter has been left by the Royal Commission as a satisfactory or final one, more especially in regard to the really absurd suggestion of the Commission that we should be content with providing for London for only forty years from the present moment. That is a very short time in the history of such a city as London, and if that position be adopted the next



generation will find the whole question with its difficulties and anxieties pressing upon them afresh. The mischief which has been done by the one-sided and narrow Report of the Royal Commission is already beginning practically to show itself. The water companies are applying for increased powers, and, as Mr. Bassett Hopkins observed in moving the adoption of the water committee's recommendations, the water companies had drawn the conclusion that because it was physically possible, according to the Royal Commission, to get a sufficient supply for forty years to come within the Thames basin, it ought to be done, a conclusion which by no means follows from the premises. According to this theory, the water companies are to go on drawing a constantly-increasing amount of water out of the Thames, which it is calculated will supply us for the next forty years, at the end of which time we shall probably be forced to look to some outside supply, while in the meantime the river will have been hopelessly spoiled as a river, and we shall have been all the while either drinking water imperfectly purified, or spending immense extra sums to ensure purification, which, when the river has at length to be abandoned as no longer sufficient, will have been all money thrown away, while we shall have been left all that time in the hands of trading companies for our water supply. Such a theory of the treatment of the subject is preposterous. The County Council has, in this matter at least, taken the first step in the right direction; and, though it will be a long business, we hope the ultimate result will be to provide London, at no very distant future, with an ample supply of water out of the public rates, instead of having it doled out by companies making huge profits out of it.

THE undesirable proposal to tack on a monumental chapel to Westminster Abbey, on the plan originally suggested by the architectural genius of Mr. Shaw-Lefevre, has been revived again by the offer of Mr. Yates Thompson to contribute the cost of erecting a portion of the building. It is to be hoped that this offer will be declined. Such an addition, in the manner proposed, would in reality be no part of the Abbey, and would therefore have no sentimental value attaching to it as a historic place of monuments, while it would afford a plausible excuse for dignifying with the supposed honour of burial in Westminster Abbey a number of people whom their friends alone would think worthy of such a distinction, and who now are kept out from "snug lying in the Abbey" by the fact that there is no room to celebrate there any but the few persons in a century who can really claim the epithet of "great." If the new chapel were built, there will be a kind of rush of "eminent men" to die and be buried in it, under the delusive idea that they are securing burial in the Abbey, instead of in what would probably be called "the Yates Thompson wing" (just as we say "the White wing" at the British Museum), since the proposing donor, with very questionable taste, has made it a condition that his name should be legibly inscribed somewhere near the main entrance. If we are eventually to have any national monument house built, it had better be made a separate thing, away from all pretence of being part of the Abbey, and built at the cost of the nation, not of donors who want their names inscribed on it.

WE have received the Annual Report of the Cremation Society of England; which does not, however, chronicle any marked steps or progress in the movement during the year. The annual number of cremations at Woking has, it appears, slightly fallen, 101 bodies having been cremated during 1893 as against 104 in 1892. The Report endeavours to account for this by the fact that Manchester has now a very

efficient crematorium, but one can hardly think that would affect the numbers at Woking.

AN important work, devoted entirely to the discussion of the metopes of Greek sculpture, has appeared in Russian; it issues, as so much does that is valuable for archaeology, from Dorpat. The editors of the *Berliner Philologische Wochenschrift* have done a real service to students of Greek art by inducing the author (W. Malmberg) to give in a recent issue (1893, No. 25) a full summary in German of the contents of his book. He begins with the metopes of Assos and Selinus, and ends with those of new Ilium. A further chapter is devoted to the metopes of temples only known to us from literary records. The portion devoted to the metopes of the Parthenon deserves special attention. Dr. Malmberg discusses not only the familiar well-preserved centaur metopes, but also all those which in their effaced condition are generally passed over with the expression of a hasty regret. He attributes the metopes of the east and west frieze to an artist of the first rank, whereas the remaining metopes were filled, as he thinks, by subordinate artists from designs furnished to them. In discussing the "Theseion," though he holds with Dr. Dörpfeld that the temple is later in date than the Parthenon, he does not concede the attribution to Hephaistos, but believe it to be the temple of Apollo Patroös. These are only scattered instances of much that is valuable, and now, through this *résumé*, fairly accessible.

THE fourth volume of the Glasgow Architectural Association Sketchbook contains a good many interesting illustrations, the most important being a series of measured drawings of the "Lower Church" at Glasgow Cathedral, by Mr. G. S. Hill. A drawback is the bad way in which they are produced in the lithograph, the elevations more particularly; many of the lines are what lithographers call "rotten," and in other cases they have run into each other and produced only a black mass where there should have been a series of lines indicating the arch-mouldings. It is difficult to say how far this is the fault of the lithographer and how far of the draughtsman; our impression is that the drawings have been reduced more than they will bear; i.e., that they have been too large for the book in the first instance. But there seems to be some fault in the lithographing, for we observe in Mr. Tait Connor's West Doorway of Elgin Cathedral, which is not on such a small scale, the same unsatisfactory appearance. The larger scale drawings are better produced. Mr. W. Cowie gives a careful measured drawing of the lantern of St. Giles, Edinburgh. Mr. Gillespie gives a measured elevation of the late Mr. Thompson's Greek church in Caledonia-road, Glasgow, again an unsatisfactory lithograph—see the columns and pediment cornice. This is a fine building, the merit of which may be appreciated as much now as when it was built; we fear the same cannot be said for the tower of St. Vincent, U.P. church, by the same architect, of which Mr. L. D. Penman gives measured drawings; one rather wonders now how such detail was ever admired. Mr. John Stewart's sheet of free-hand sketches of "Old Scottish Work," including a most interesting old tomb in Greyfriars Churchyard, Edinburgh, is one of the best pages in the book. Mr. F. M. Miller gives drawings and detail of a fine old cabinet in the Industrial Museum at Edinburgh. Mr. Muirhead's sheet of measured drawings of Jedburgh Abbey is very well done, and his method of showing sections of mouldings by a fine line is far preferable to the method adopted by many draughtsmen of running a thick line of black along the inside of the moulding, which looks bad on the page and often confuses the eye as to the real line of the moulding. Most of the mouldings in the book are drawn in this rather objection-

able fashion. If it is preferred to shade the inside of the moulding, a clean thin outline and a neat hatching inside it is the best way. The Montgomery Monument at Largs (Late Renaissance), sketched by Mr. Muirhead, looks such a fine thing that it deserved a more careful drawing. Mr. W. J. Anderson gives a good pencil sketch of St. Mary's, Oxford, and Mr. A. Mackintosh a still better one of the east end of St. Paul's, which is perhaps the best thing in the volume. It would be an improvement to number the plates in the margin and in the index.

THE first of a course of six lectures on matters relating to building, arranged for by the Carpenters' Company, was given in the Carpenters' Hall, London Wall, on the 21st ult., by Professor Unwin, F.R.S. The subject of the lecture was "Niagara and the Works for its Utilisation," and a series of lantern views of the Falls and of the works carried out for utilising the water for motor purposes was shown by the lecturer, who, in the course of an interesting address, referred to "the great waste of force" at Niagara, in a manner which reminded us of Edison's similar lament at the wasted force typified in the waves of the ocean—regrets which are seemingly the outcome of scientific methods of thought, and which do not appear to leave much room for the proper appreciation of some of Nature's works. It appears that as early as the year 1725 water-mills were erected at Niagara, but as they spoiled the appearance of the Falls they were subsequently removed; moreover, about eight years ago, both the Canadian and New York State Governments, becoming ashamed of the disfigurement of the Falls, partly by mills and partly by the advertisements of enterprising tradesmen, purchased a quantity of land on both sides of the river as a State reservation, on which no more works were to be erected. In 1853 a more important work—a hydraulic canal—was constructed, by means of which about 6,000 horse-power have been utilised for the last quarter of a century; but the works which have been constructed within the last three years, and which are now practically finished, are of a much larger character. They were described in detail by Professor Unwin, who showed some interesting views of the immense hydraulic tunnel which has been built, and which has a capacity of 120,000 horse-power. The first enterprise to take advantage of the works was the Niagara Paper-Mill, the largest paper-mill in the world, but other contracts have been entered into. To complete the work, all that remains to do is to finish the general powerhouse, where 5,000 horse-power turbines will operate 5,000 horse-power electric generators. The lecture was well attended, being, like those which are to follow, free to the public.

THE second of the Carpenters' Hall lectures was given on Wednesday by Professor Corfield, whose subject was "House Sanitation." The lecturer did not cover the whole ground of house sanitation, the subject of ventilation, heating and warming being excluded from the lecture; it was limited, therefore, to a consideration of house sanitation in relation to water supply and drainage arrangements. Professor Corfield has the merit of dealing with technicalities in an extremely clear and interesting manner, and in the course of his lecture he spoke of the various and best kinds of water-cisterns, supply-pipes, sinks, traps, water-closets, soil-pipes, and drains, and described a number of diagrams of water-closets, &c. In his remarks about supply-pipes the lecturer mentioned a fact which is not generally known, we believe viz., that if small iron pipes are coated with Angus Smith's solution as soon as made, and before they are stacked, the solution will adhere. A diagram of the first water-closet patented in this or any other country was shown, and, as the lecturer pointed out, what is known as the valve-closet is really a modification of



it. The patent was taken out in the year 1775 by Alexander Cumming. The pan closet, of course, was only mentioned to be condemned, as it has been by the County Council by-laws; and, in the opinion of the Professor, the best form of a simple water-closet basin yet contrived is the short Hopper. In addition to the diagrams, water-closet and other apparatus was described by the lecturer.

MRS. PHILIP NEWMAN read an interesting paper on Tuesday last on Goldsmiths' work, past and present, before the Indian Section of the Society of Arts, which was one of the first that had been delivered before the Society by a lady. Mrs. Newman dealt more particularly with the technical side of goldsmiths' work—a subject of which she has during the last twenty-five years made a special study, having previously modelled and designed for work of this class. Having touched upon the antiquity of her subject, and the literary history of the art, Mrs. Newman, in quoting from an old author that "Gold is very ductile, a spreading and oily metal," described how gold can be hammered, drawn as wire, and fashioned without heat, and is practically ductile enough for these operations without the aid of steam-power, many of the oldest specimens having been worked cold by sheer force. Mrs. Newman referred to the working of pure gold as almost an impossibility, and in discussing the alloys, stated that Purity being represented by twenty-four, standard gold has twenty-two parts pure and two of alloy; eighteen carat gold, eighteen parts pure to six parts of alloy; French gold has a reddish tinge, derived from its alloy of copper. Gold being alloyed to 22:18-15:12 or nine carat, it is melted in a furnace, and having been poured into a mould, is ready for flattening, which is done by rolling it between two heavy steel rollers to the thickness required for the work. Mrs. Newman's description of gold-beating process may be quoted:—

"The gold is cast into oblong ingots, about  $\frac{3}{4}$  of an inch thick and wide, and weighs about 2 oz.; this is flattened into a ribbon about  $\frac{1}{16}$ th part of an inch thick, then annealed or softened by heat, and cut into pieces about an inch square; 150 of these are put between vellum, each piece of gold in the centre of a square of vellum; another and another added, until a pile of 150 is made. This pile is enclosed in a double parchment case, and beaten with a 16 lb. hammer, the elasticity of the packet lightens the labour, as the hammer rebounds with each blow. The beating is repeated, until the inch pieces are spread out to 4-in. squares; they are then taken out, cut into four pieces each, placed this time between gold beaters' skin, and hammered as before, but this time with a lighter hammer; they are again quartered, and again hammered, thus producing 2,400 leaves, having an area of nearly 200 times that of the ribbon, and a thickness of  $\frac{1}{1000}$  of an inch."

Some time elapsed after the discovery of the Etruscan gold-work before it was found possible to copy the colour, but it is now obtained by a proper proportion of common salt, saltpetre, and alum, heated with distilled water to 212 Fahr., with the help of scratch-brushing. This treatment gives 18-carat gold the fine bloom of the best Etruscan work. Mrs. Newman very rightly lamented the difference between antique and modern work, and remarked that the processes differed little, but that the lack of an intuitive feeling for art made the gulf between the past and present work of the goldsmith. The subdivision of work of the present day only robs the work of all its interest, and produces workmen who cannot make the article complete, but merely parts. Mrs. Newman briefly traced the history of the goldsmiths' art through early Christian and Roman times to the times of the Renaissance, and referred to the treatise on the craft written in the eleventh century by the monk Theophilus, which evinces a practical knowledge hard to excel even now. At the conclusion of the paper a series of lantern slides illustrating goldsmiths' work were shown, and the usual discussion followed.

IN a "Note" of October 3, 1891, we adverted to the demolition of the Hall, Clement's Inn, and to the leaden figure of the negro supporting a sun-dial, which the Earl of Clare gave to the Society, and Mr. W. Holmes bought for twenty guineas and presented to the Society of the Inner Temple. Some other relics of the Inn were sold by auction at Willis's Rooms a few days ago; being described as a set of portraits, by unknown painters, of celebrated judges and members of Clement's Inn, comprising Sir Edward Coke, Sir Mathew Hale, and Lords Coventry, Thurlow, and Mansfield, together with a silver-headed mace (eighteen guineas) given by the members, in 1794, to J. Blackwell. The block that now covers the hall site was built by Mr. E. C. Bull, from Mr. C. A. Monday's designs and plans; the chambers in course of erection on the garden site are being built by Mr. Bull, alter, as we are informed, Mr. Monday's designs, and under the superintendence of Mr. George Sherrin, architect. The new red brick buildings at Hare-court, Temple, are being constructed after Mr. T. G. Jackson's plans and designs; the contractors are Messrs. J. S. Shillitoe & Son. They will abut, in Middle Temple-lane, against the quaint block of houses, covered with rough-cast, which extend northwards to Wren's gateway, and are, we believe, the oldest remaining sets of chambers in the Temple. Messrs. Abram & Sons, printers and law stationers, of Middle Temple-gate, a long-established firm, recently sent to the *Times* highly interesting particulars to show that some principal works by the greatest English authors of the seventeenth and eighteenth centuries were published at Middle Temple-gate. Ashmole had chambers in the lane; Sir Amyas Paulet built the former gateway, under fine, Aubrey tells us, by Wolsey.

TO find that Mr. Fulleylove has been making a series of sketches in Paris must be a matter of interest to all who are acquainted with his water-colour drawings of architectural subjects. It may, however, perhaps be said that Mr. Fulleylove is not seen quite at his best in the collection of drawings exhibited at the Fine Art Society's gallery under the title of "Paris To-day," for the reason that his style of work is better suited to drawings on a larger scale than the majority of these. Many of them are on a smaller scale than this artist usually works; and his style seems to require more space for broader surfaces of tone and colour; the small drawings here are somewhat heavy and wanting in light. Nor in architecture is he so good with Gothic work like Notre Dame, and with picturesque narrow streets, as with the broad surfaces and open surroundings of Renaissance buildings and gardens. The best drawings in the collection are mostly the larger ones or those that deal with Classical Paris. "Versailles" (52), a garden scene in which the characters of the period of the palace are introduced, with part of a sculptured fountain in the foreground and a fine mass of trees on the right, is admirable; so is "Garden of the King, Versailles" (53), and "Termes in the Garden" (50). Among the smaller drawings some are charming in effect however; notably the "Allée des Orangers, Tuileries Gardens" (31), which is full of sunlight; the "Luxembourg Avenue" (37) with Carpeaux' fountain in the foreground; the "Arc de Triomphe du Carrousel, from the Louvre" (57), "St. Etienne du Mont and the Pantheon" (62) seen from the north side of the church; the scene in the Tuileries Gardens (69); "The Pantheon" (73) seen in a glimpse down a narrow crooked street. In "The Tuileries Gardens looking towards the Arc de l'Etoile" (21), the distant arch is put in too strongly and positively, and does not convey the idea of its scale and distance. In general, however, the well-known scenes are represented with remarkable truthfulness. We should not omit mention of a powerful and unusual little study of "Notre

Dame" in a rainstorm (55), the only representation of the cathedral that we cared for. We are inclined to think Mr. Fulleylove should stick to Classic architecture; he has a special genius for that, but apparently not for Gothic.

#### LETTER FROM PARIS.

THE exhibition of "Femmes Peintres et Sculpteurs" opened a few days ago; an exhibition at least as much "mondaine" as artistic, and in the latter sense of hopeless mediocrity. Mme. Léon Bertaux, the really able artist who presides over the Society, shines the more through the absence of any kind of rival, and contributes the only works that are worth looking at. It can hardly be believed that most of the artists exhibiting here would be any the better for securing that education at the "École des Beaux-Arts" which they so persistently demand; their best chance would be to enter the School of Industrial Art, ably presided over by M. Paul Colin at the "École des Arts Décoratifs."

The neighbouring exhibition of the club "l'Epatant" (the old "Mirilltons") draws a crowd of visitors; and among the mass of amateur work of no great value we find some interesting pictures signed by well-known names. Portraits predominate; and among these a portrait of M. Gerôme, by his son-in-law M. Aimé Morot, is a good likeness and a fine picture. MM. Jules Lefebvre and François Flameng send some good portraits of ladies, and M. Detaille, in a battle picture, shows his usual ability in realistic detail for which one can partly pardon his hard execution. M. Gervex, following the Napoleonic craze, has painted a kind of Napoleon of the Opéra Comique declaring his passion to Josephine de Beauharnais. Of two pictures by M. Carolus Duran his "Joueur de Mandoline" is certainly the best. The same artist exhibits two landscapes, the style of which recalls those of Curzon and Cicotti. The well-known boom companion of M. Roybet is here again, as rubicund and commonplace as ever, suggesting a kind of vulgarised Franz Hals. M. Bouguereau's work, "L'Amour Piqué," is as charming and conventional as usual in its pink and pearl flesh tints; quite destitute of real life, but very attractive for all that to the general run of spectators. Of sculpture there is not much to speak of.

At the exhibition of the "Aquarellistes" we get rid of the amateur element, and meet with real and in some cases great artists. Among these may be specially mentioned the "Sentier des Loups" and "Île aux Loups" of M. Bonny; the "Chènes Verts à Passarella" and the view of "Le Pont Salario" by M. François, which are so full of power and freshness that no one would take them for the work of an octogenarian painter. The contributions of M. Couvent, M. Yon, and M. Zuber are also very fine; and M. Desnoes' water-colour is a very superior artist to M. Detaille, at the "Epatant" club; his "Reconnaissance sous Bois" and his "Chasseur à Cheval" are full of energy and fine colour. M. Benard has brought some picturesque sketches from Algeria; M. Rochegrosse, as usual, is original and violent to the point of eccentricity. M. Lhermitte sends some fine charcoal studies. One of these, the "Halle aux Légumes," constitutes the study for a large picture intended for the Hôtel de Ville.

As already mentioned, the Champ de Mars Salon will this year open in advance of its older rival. There has been again some talk of a union between the two Salons, on the occasion of the Vienna Exhibition, where a sole delegate, chosen by the Directeur des Beaux-Arts, could represent both the societies. But the conciliatory intentions of the Administration have been of no avail, and the rival Salons have decided to exhibit separately at Vienna, and to be represented there respectively by M. Bonnat and M. Carolus Duran. It is difficult to know how these rivalries are to be accommodated when the present buildings or their sites are required for the 1900 Exhibition. Are we to build two new Galleries for the two societies to keep up their rivalry in?

At the Louvre we find, in the Oriental Section, various new possessions of genuine artistic interest, among others a large bronze patera of Chinese workmanship, some Japanese engravings, and a fine writing-box of lacquer and gold with a most elaborately-decorated cover. In the section of ivories we may mention also the acquisition of a splendid Byzantine triptych. The Luxembourg has also some new possessions in the shape of a fine picture by M. Edelfelt, "Journée de décembre en Finlande," and two silvered bronze plaques by Antonio Gardet.



The members of the society entitled "Amis des Monuments Parisiens," together with some well-known artists, have been making an archaeological expedition with the view of studying the remains of the old Louvre of Philippe Auguste. The visitors, conducted by M. Guillaume, the architect to the Louvre, went through the vast subterranean vaults of the old Louvre, principally those below the Salle des Caryatides and the gallery of the Venus of Milo. In the course of the promenade they discovered, in a sewer of the time of Pierre Lescot, an engraved stone, bearing the date 1567, and a carved representation of a soldier of the reign of Charles IX.

Last Saturday the Académie des Beaux-Arts proceeded to the election of two corresponding members in place of M. Fraikin, the Belgian sculptor, and Mr. Hunt, the American architect. M. de Vigne, of Brussels, was nominated in the section of sculpture, and M. Sainte-Marie Perrin, of Lyons, in that of architecture.

By the time this letter appears, Parliament will probably have pronounced on the important question of the scheme of taking the Paris sewage to Achères. The scheme of the Municipal engineers, which is a kind of heritage to them from the late Durand Claye, has encountered violent opposition in the environs of Paris, especially in the Department of Seine-et-Oise, and this opposition will certainly not be unrepresented in the Chamber of Deputies and in the Senate. It is a question of the expenditure of 117 million francs on a scheme which is the inevitable outcome of the theory of "Tout à l'égout." On the other hand, the inhabitants of places on the Channel coast are equally opposed to a counter-scheme for taking the Paris sewage into the sea. The one scheme is denounced as creating a large circle of pestilential land around Paris; the other as likely to drive away for ever from the Normandy coast the numerous bathing-season visitors. Without endeavouring to anticipate the conclusions of the Government, we may observe that the construction of the purification works for the sewage at Clichy, in connexion with the Achères scheme, is actually in progress. It is from this point that the syphon pipe is to pass the Seine, carrying all the sewage brought down by the main sewer from Asnières, and which at the present moment is contaminating the whole river as far as St. Denis. This part of the work has been entrusted to M. Berlier, the engineer who projected the tubular railway scheme. He hopes to have completed his work by next August. The syphon-drain will consist of an iron pipe, 2½ metres in diameter, with a cement lining. It will emerge on the left bank of the river, after having traversed the two arms of the Seine, separated by the "Île des Ravageurs." The length will be 480 metres, and the cost is estimated at a million francs.

The late sculptor Cavellier, whose recent decease has been recorded in our "Foreign" notes, was born at Paris in 1814, and studied under David d'Angers. He obtained the Prix de Rome in 1842, and on his return from the Villa Medici he rapidly made a reputation, crowned by the award of the Medal of Honour of the Salon in 1849. The statue which gained him this honour was his "Penelope Endormie," certainly one of his finest works. From this time he received numerous commissions from Government, and took part in some great decoration schemes. Among his best known works may be mentioned "Jeune Grecque remportant le Prix de la Course"; the statue of St. Matthew; the portrait statue of Mgr. Affre, which is in Notre Dame; that of Pascal, placed in the arcade of the Tour St. Jacques; the "Fame" in front of the Galerie d'Apollon; the caryatides of the portion of the new Louvre; the "François I." in the old Hôtel de Ville, &c. Cavellier also executed numerous busts of celebrated personages, amongst them those of Ary Scheffer, Horace Vernet, Henriquel Dupont, and Napoléon. He was a very learned and conscientious artist, whose work recommended itself by elevation of style as well as excellence of execution. He was officer of the Legion of Honour since 1861, Member of the Institut since 1865, and Professor at the École des Beaux-Arts. Among his pupils were many of the best French sculptors of the day—notably MM. Ernest Barrias, Idroca, Guillaume, Coutan, and Charpentier.

We have to mention also the death at Versailles of M. Dussieux, a literary man of distinction and an able art-critic. We owe to him two excellent books, "l'Histoire du Château de Versailles" and "Artistes Français à l'Étranger." He was seventy-nine at the time of his death.

## THE ADVANCEMENT OF ARCHITECTURE.

ROYAL ACADEMY LECTURES BY PROFESSOR AITCHISON, A.R.A.—LECTURE V.

THE Renaissance, as far as architecture is concerned, is one of the strangest episodes in history, and though so many have tried to explain it, and amongst them men of such ability and research as the late J. A. Symonds, it still remains somewhat of a mystery. Its effects on architecture have been so fearful that it is necessary to treat of it at some length. Up to this partially antiquarian revival architecture had run a continued race; the torch had been handed, it is true, sometimes to a civilised, sometimes to a savage, and sometimes to a barbarous runner, but they all ran forward in what they supposed to be the right direction, but when it was handed to the Renaissance runner, he ran back.

It was most fortunate that Greek architecture fell into the hands of the Romans, though architects have of late deplored it, because there is only one imaginable case in which it could have fallen into better hands—i.e., if there had been a nation to receive it, which was gifted with the same culture, the same acute perceptions, with greater invention, and with grander and more complex requirements. But to imagine this is to suppose there was such a nation; while in fact no such nation then existed, or has since, unless we consider that the Florentines of the fifteenth century answer to this description. Greek architecture had reached perfection in the lines it had started on; it was "The one thing finished in this hasty world." If the Romans had been artistic instead of the reverse, they could have done nothing more with it, except use it on a larger scale; fortunately they were not artistic.

The best of them could but just perceive the merits and perfections of Greek architecture, while the bulk of the nation had never seen it, and if they had would have preferred Roman architecture. The Romans, being a conquering and building nation, with a knowledge of the arch, not only Romanised the debased Greek orders but tried to make a compromise between an arched and a post-and-lintel style; this compromise was only temporary and ended in the displacement of the lintel by the arch; this displacement was not absolutely consummated till after the seat of Empire was transferred to Byzantium. The savages who had overrun the Western part of the Roman Empire, as they gradually got partially civilised, produced from the Roman and Byzantine buildings and their ruins, a style we now call Romanesque.

These savages were nominally converted to Christianity, and finally advanced to barbarism. They tried to preserve from conflagration the temples they had built to their new faith. The only way of doing this was by using ceilings of masonry; but their skill was not equal to this, except where the spans were small. At the very end of the eleventh century these barbarians, who had only just begun to settle down, made a military tour through Europe, Asia Minor, Syria, and Palestine, and thus became acquainted with the masterpieces of ancient architecture, with those of the contemporary Byzantine Empire, and with the new architecture of the Saracens. During the time the Crusaders still held places in the east, the geometrical studies revived by the Saracens had become the fashion, and some advances in philosophy had been made, in which rationalism held a conspicuous place.

In the east the Westerners saw pointed arches commonly used, and adopted them, and gradually found out how the adoption of pointed vaults would help them over their difficulties; they also learnt by experience the strength of various sorts of stone, and more or less to properly about the thrusts of arches and vaults by the aid of buttresses and flying buttresses, and eventually they cut away and turned into windows almost the whole of the screen walls between the buttresses, while at the same time they invented new methods of adornment. How new forms and arrangements in art could ever have been invented is to us incomprehensible and almost miraculous. Miraculous interventions in aid of architects which had been so frequent in pagan and Romanesque times, ceased to occur as soon as the architects had learnt to build.

The new and marvellous architecture we call Gothic, spread, and specimens of it may be found from Scotland to Cairo and from Scandinavia to Madeira and the Canaries.

Towards the end of the fourteenth century

skill in stone-cutting was preferred to aesthetic effect; it was in the eyes of the people of those days, the one thing needful, hence the slight external pierced screens, the interpenetrating mouldings, and eventually the fan tracery on pendants; and though a little grace began to be imparted to the work, there was an inclination to make everything wiry, and not to leave a morsel of the surface plain for the eye to rest on.

Italy from the thirteenth century seems to have been singularly wanting in architectural schools. The Gothic brought by French and German architects was used in Italy mainly as decoration, except at Milan, which seems to have been wholly in artistic dependence on Germany. No really organic Gothic is to be found in the upper part of the Peninsula, some form of Byzantine, Romanesque, or decorative Gothic being mostly used to the end of the fourteenth century. The clergy's business being to look after peoples' interests in the next world made them wholly indifferent to their interests in this world. And they first had to combat the elegant paganism and luxury of a decayed civilisation, and therefore discouraged learning, not only as useless, but as favouring paganism and philosophy, and as being opposed to the view that this world was but a vale of tears.

After the invasion of the savages, and during the dark ages, besides having to nominally convert the conquerors, the clergy had to try and infuse into these ferocious, bloodthirsty, and brutal savages, some respect for law, order, and industry. The liturgy and the Bible being in Latin, the grammar could not be properly taught without examples from the poets, orators, and historians; and these, as well as the works of the Roman lawyers and the Classic philosophers, were necessary for the teaching and mental enforcement of law and order, so that we find Dante speaking of most of the Latin authors and of the principal Greek poets and philosophers. The works of such Greek authors as were known were translations into Latin of the Arabic versions. Dante, the great Medieval poet, died in the first quarter of the fourteenth century. His immediate successors, Petrarch and Boccaccio, became humanists—that is, were more devoted to the learning, knowledge, and culture beneficial to man here, than to theology. In Scotland the humanities are still a branch of education, and comprise grammar, rhetoric, poetry, and the classics. Dante had seen how superior the Latin classics were in style to the Medieval writers, and adopted Virgil as his guide in poetry. Nicola Pisano, the architect and sculptor, who died when Dante was a boy, had made the same discovery in regard to sculpture—i.e., that Roman sculpture was very superior to Medieval carving, and had adapted for his pulpits the figures from a Roman vase and sarcophagus. Brunellesco, the sculptor, who was born in 1377, the year after Petrarch died, knew one of the celebrated humanists; he went to Rome to study the Pantheon and other domes, so that he might fit himself to dome the cathedral at Florence. He must also have been affected by the rising taste for classical studies, which was in the air, and was probably struck at Rome with the superiority of the old architecture; at any rate, he is believed to have been the first who designed and saw carried out the revived forms of Roman architecture.

It is necessary to say something about Vitruvius, as his work had great influence; every scholar thought Vitruvius contained the recipes for this fine Roman architecture, that all were bound to admire. Professor Cockerell believed that Vitruvius was known and studied during the whole of the Middle Ages. He says: "The church in the Castle of Nuremberg, built by Barbarossa in 1158, and the Fraumkirch in the centre of that great city, probably of later date, are exact illustrations of the 'Temple in Antis' of Vitruvius, as given by Cesariano (lib. iii. fol. 52.)"—"The Architectural Works of W. of Wykeham." C. R. Cockerell. Svo. 1846. Pamphlet.

We see from Cesariano's cuts and annotations that the Mediaevals had applied Vitruvius' classification of the temples from the outside to the inside, so that a decastyle temple was a church with ten pillars to the nave, a dipteral temple had two aisles, and a pseudo-dipteral an aisle of double the usual width. I believe the codices of Vitruvius now known are of the ninth, tenth, eleventh, and twelfth centuries. An unbound MSS. volume of Vitruvius's is mentioned by Beccadelli as belonging to him, and when Alphonso "the Wise," who was going to trust entirely to Vitruvius for the additions he was about making at Naples, received the leaves, he



made the celebrated remark, "It is not becoming that this important book, which teaches us so well how to cover in ourselves, should go about uncovered." Beccadelli lived from 1394 to 1471. The *Editio Princeps* of Vitruvius is without title, place, or date, but is believed to have been printed by G. Herolt, and published in Rome about 1486; it was edited by Sulpitius from a codex found by Poggio Bracciolini at St. Gall about 1414. The concurrent circumstances of a passion for style, beauty, and delight, for intellectual freedom, and for the study of the classic authors, turned the thoughts of Italians towards Rome.

The knowledge that Rome was once not only the capital of Italy, but the centre of an empire embracing the ancient civilised world, and was then full of splendid buildings, some of which remained, while the sublime ruins of others attested the fact; the absence of any organised style or organised schools of architecture, made even those Italians, who cared not for architecture, violent partisans of a revival of ancient Roman art.

It became the fashion, too, to call Byzantine, Romanesque, and Medieval architecture, Gothic, Arabo-German, and the "tasteless style."

Architecture got into the hands of scholars, antiquaries, goldsmiths, painters, and sculptors, and became, as Michelangelo called it, a branch of the art of draughtsmanship. The belief that the architecture of Rome was perfect certainly held full sway in the civilised world until 1768, when Milizia published "The lives of Celebrated Architects."

Florence, which has been called the modern Athens, and was said by Boniface VIII. to be the fifth element, was the natural place for new views on everything to spring up, including the fine arts. The probability is that Brunellesco, having gone to Rome to pick up something about domes, was so much struck by the style and dignity of the Roman remains as to induce him and his companion, Donatello, to measure them. On Brunellesco's return to Florence, he naturally advocated a return to Roman architecture; but, had this accident not happened, it could only have retarded the movement by a few years.

Students, writers, sculptors, painters, men of active intellect, and those who wanted to enjoy life, were all led the same way. The proverb which says that "All Roads lead to Rome" was then true.

It must not be forgotten that the discovery of the West Indies and South America by Columbus at the end of the fifteenth century, and that of the motion of the earth round the sun by Copernicus, were very practical comments on the advantage of a free exercise of the intellectual powers.

The fame of the discovery of an ancient codex of Vitruvius by the Papal Secretary, must have awakened a new interest in the work, though there were possibly a few MS. copies about. Vitruvius being printed at Rome must not only have made it more accessible, but more talked about, and have thus drawn attention to the fact that in it were to be found the recipes for the manufacture of that architecture so much admired by all men of taste. We must recollect that as there were no schools of architecture, painters or sculptors who had been employed on buildings were thought fit to be architects.

Early in the fourteenth century, Niccolò Pisano, the sculptor, was taken off to Naples by Frederick II. as his architect, and subsequently Giotto, Taddeo, and Agnolo Gaddi and others were so employed at Florence—occurrences that would have been wholly impossible in France, for, notwithstanding the extraordinary capacity and versatility of these early Italians, they could not have drawn the lines for complicated stone-cutting without a special education. It must be admitted that Brunellesco, who was a most acute man, did turn himself into a constructive architect by means of effort and private study, though he would have done better to have gone to Constantinople than to Rome, for doming was there a well-known art.

Leon Battista Alberti, whose mighty personality still affects us, like that of Leonardo da Vinci or Michelangelo, was the successor to Brunellesco. He was one of the extraordinary men that Italy produced at the Renaissance—a Latinist, who passed off his play on Aldus as a Classical work; who, besides his wit, his engaging manners, and his skill at manly exercises, was poet, mathematician, painter, sculptor, architect, and writer on manners. He became a Canon of the Cathedral of Florence to have time and opportunity for study, and is said never to have wasted a minute. He built some churches, altered San Francesco at Rimini into Malatesta's

Temple to Isotta, within whose external arcades are the tombs of some of the great Greek and Italian humanists—Gemistos Pletho, for example—and also built the Rucellai Palace at Florence.

It is very difficult for us to put ourselves in the place of the cultivated Italians of the fifteenth century. We are sick of the orders, for we have seen little else on the important monuments of the last three hundred years, and every architectural pupil has drawn them out.

In Brunellesco's and Alberti's time they were not only new and superior in style to anything the people had seen, but were hailed with delight as symbols of ancient Rome—that Rome that was once so great, whose splendid literature had not only charmed them, but had freed them from asceticism, and from the mental thralldom of the clergy. A capital, a griffin, a torso, a coin, an engraved gem, or a bit of foliage enraptured everyone; these were fragments from the hands of those great and good Romans who did everything so nobly and so well, and who lived in freedom and happiness like the gods. Rabelais' book of *Garagantua and Pantagruel* is a ribald one, but, as far as I know, it alone gives some notion of the feelings of mankind at the Renaissance, and that, too, without the darker traits of Italy. You must read the "Murderous Machiavel" for that; however, J. A. Symonds' work on the Renaissance is enough for most of us, and for the graver side of learning, Milton's poems give us some idea of the variety and vastness of the attainments at the Renaissance. The idea was this, that there was to be great intellectual cultivation and curiosity, great splendour, great personal achievements, and great enjoyment, but the only law was to do what one best liked, which was to result in perfect happiness. What it did result in, in too many cases, was a return to the worst vestiges of paganism, in which distinguished men too often indulged, almost without a reproach; Bevenuto Cellini's biography is a fair picture of artist life. Nothing like this licence has occurred since, till the orgies of the French Revolution, when everyone was to be good and happy, after all the wicked aristocrats had been butchered. It is only reasonable to suppose that, when architecture mainly took the form of decoration, and was carried on by accomplished figure draughtsmen of the acutest intellects and the most refined taste, that the product would approach perfection. The proportions attained in the best examples were altogether lovely. At the beginning of this antiquarian revival, many of the smaller semi-architectural works, such as tombs and monuments, were so beautiful as to be almost divine, only the divinity was a Roman one. The enormous superiority in style of these monuments over their Gothic precursors cannot be better seen than in "the Sepulchral Monuments of Italy" by the Arundel Society. I may mention the monument to Leonardo Bruni by Rossellino, 1444, and that of Carlo Marsuppini by Desiderio da Settignano, 1453, both at Sta. Croce—a cast of the latter is at the South Kensington Museum; that of Bartolomeo Ordici, 1466, at Forlì; those of Bernardo Guigni, 1468, of Ubaldo, the Marquis of Tuscany, 1472, both by Mino da Fiesole, and at the Badia, Florence; that of Pietro da Noceto, 1470, by Matteo Civitate, in the Duomo at Lucca. Those at the Badia, and that of Marsuppini have some of the panels of dark purple porphyry, which is a most simple and effective way of getting monumental colouring.

Practically there were no examples amongst the Roman remains of the building wanted, so such buildings as had been done by Byzantine, Romanesque, or Gothic architects had to be followed as models, and on these the Roman architecture and ornaments were grafted, or Roman architecture was substituted for the old forms: enriched too by a taste and spirit that the Romans did not possess.

The great prison palace of Florence the Pitti, attributed to Brunellesco, brings to one's mind nothing but thoughts of the dungeon and the rack, however fine it may be as a mass. The Rucellai Palace, by Alberti, however, is lighter and gayer, although the main walls and archivolts are rusticated; it has three orders of pilasters, with their entablatures, and is cut up into apparently equal divisions, except where the two doorways occur, and in these the spaces are a little wider; round arches with very deep archivolts fill up the space between each pair of pilasters, and are formed into double-arched windows by a central column: the ground floor is lit, after the old Florentine fashion, by square windows about 15 ft. from the ground, to prevent the inmates being shot by a passing enemy.

The third great architect of the Renaissance,

Bramante, built one of his most delightful works, the Cancelleria, at Rome. This front is also like that of Rucellai, regularly but unequally divided by pilasters, which might almost be called coupled above the ground story—i.e., there is a narrow space and a wide space alternately between the pilasters; the narrow space is blank, while the windows are in the wide space. The front, however, has grace, that the Rucellai Palace cannot pretend to, for besides minor points that add to its beauty of composition, the round-headed windows are enclosed by square lines.

The other great and characteristic palace is the Farnese, supposed to have been built by Antonio Picconio, who took the name of his uncle San Gallo. Here the front is treated as a whole, the frieze and cornice being proportioned to the total height of the building. This palace has no columns or pilasters, but is treated wholly by windows. The ground-floor windows have dressings and a cornice without a pediment; those of the first, or noble floor, have alternately triangular and segmental pediments, and the top floor has only triangular pediments. Michelangelo is said to have had some say or hand in the matter, to which the simple grandeur of the whole, as well as the botches of the first floor cornice window and the arched openings in the second floor, give some colour; the cornice is said to be by Vignola. Whoever designed the Farnese Palace had mastered the law of repetition without variety, which gives such dignity when properly done. The rusticated carriage entrance is too narrow for the front, and is too inconsistent with the rest of the architecture.

Venice is the next place where we can study the charms of the Early Renaissance.

The outside of the Sta. Maria dei Miracoli at Venice is delicate and picturesque, and the inside is even more so. The altar-screen, which is pierced, is after the best Roman models, where Roman art was interpenetrated with Greek forms. This church, together with the Venetian, Spinelli, and Manzoni palaces, are attributed to some of the Lombardi, the family which did so much, in the Early Renaissance times, for the architectural and sculptural adornment of Venice.

In these examples the Roman decorative use of the column is followed. It is curious how the Roman orders became an object of worship even to our own time. M. Paul Sédille, whose review of modern English architecture we have all read with such pleasure, wrote a life of Joseph Louis Duc, the architect of the July Column and the Law Courts. In it he quotes the following opinions of Duc on the orders: "Without the order what would our monuments be? Is it not the order which, by its proportions, regulated by those of man, becomes the unit and measure of buildings?"

What confusion would at once be produced if the order were suppressed! The strangest proportions, sometimes shortened and crushed, sometimes of a height without limit, would form an incoherent whole, which might for an instant astonish and dazzle the eyes, but could never charm them." M. Sédille then adds this: "So M. Duc thought that without the employment of the order, construction and not architecture could alone be produced." He reminds us that, "Even in the Middle Ages, the orders were incorporated in the pillars, at first on their principal faces, then on the angles and on the points which mark the effort of carrying weight. It was the condition of beauty in these monuments, in spite of the sacrifice of all proportion in the orders. Without these last vestiges of poetic essence, there would only remain masses of inessential matter."

Duc's remarks form a graceful prologue to what I am about to say. His profound study of Roman architecture had somewhat biased his taste, though not his judgment; for it is evident he did not quite mean what he said. He felt the charm of those gradually-perfected proportions in the Roman column, as who has not? But he also felt that he could condone the want of classical proportions if he got the column; that is a shaft simple or compound; if the duties the column had to perform were architecturally marked the capital condensing all the pressures that came on it, into the shaft, and the base spreading the concentrated pressure of the shaft on to the earth. The column is but a pig to support direct compression, rounded both for convenience and beauty, and, as I have just said, its capital is to concentrate pressure, and its base to spread it. The proportions of the shaft show the architect's knowledge of the strength of the material, and of the necessary statical conditions of the architect's business is to make it proper



press its duties in accordance with the character of the room or the building. The constructor is ignorant if he uses ten times as much material as is wanted; so a column of wood, of soft stone, of hard stone, of marble or of iron will vary in proportion to the strength of the material; and the architect is a bungler if he cannot make the proportions right, characteristic, and becoming. The burly porter may carry a heavy weight on his back, and if he carries it we do not ask for grace; but if we want it carried by an athlete we want it done gracefully and without a painful effort being apparent; it is the difference between Atlas and Heracles.

The floral elegance of a Corinthian capital carries us away, but it has a rather unstable look, and is not to be compared to the Greek, Ionic, or Ionic for propriety of expression.

I may here remark on the advantage in the use of symmetry, in the Vitruvian sense, of the use of one uniform material throughout a building. Granite and marble columns, if proportioned according to their strength, look too light for a superstructure of freestone, and the disproportion is still greater when a cast-iron column is used. We can bring ourselves to support the conjunction of iron with brick or stone by an effort of the understanding, but this effort rather breaks the continuity of our visual satisfaction. The best solution I have seen is cast-iron columns carrying masonry was at the Paris Exhibition of 1889. The early Romans did very little taste for the fine arts, and probably had few sculptors amongst them. They had admired the Greek temples; and entablatures in their columns were looked on as symbols of art. When columns were no longer wanted to support architraves, they were still looked on as essential to architecture. In the forum of Nerva there are splendid columns, but to make them more effective they were not kept under the main entablature, but were projected out, while the entablature over them had probably nothing to carry but a vase or a statue. Earlier than this, when the Flavian amphitheatre was designed, it was enriched by a series of stories of columns with entablatures to each, so that its appearance is that of an oval many-storied temple, between whose columns another structure has been inserted.

Antique Roman work was considered by the Italians of the Early Renaissance as perfect, and to be imitated; for you must recollect that the Renaissance architects were not architects according to our view; but were sculptors, painters, or goldsmiths who wanted to make the exterior of their buildings agreeable, and were therefore not troubled by any kind of structural absurdity. With them columns did not represent a purely constructive feature made beautiful, but were looked upon as beautiful, and convenient things for cutting up a surface. This view was even now hardly extinct, and was in full vigour up to a comparatively recent period. Many of our public buildings, and perhaps even more of our grand corporate and private buildings, have the appearance of being built within the colonnades of ruined temples; and it is fortunate when the temple stands on the ground, and is not raised on a lofty basement, which takes away the very semblance of reality, and shows the purely artificial of the proceeding. There are excuses to be made for these vagaries, among nations and in times when sculpture was unknown, or was in such a debased state that it could produce no emotion, and was like rude, early sculpture, really used as a mere writing to tell a story. But we now have admirable sculptors, who could tell us all the emotional stories of the past and convey to us the very perfect form of human beauty. They must, of course, express any stirring incident of the present day, because our clothes not only blur the form in repose or action, but are in themselves so ignoble to raise anything but laughter or contempt. I consider it most despicable to name a building in the present day, by covering it with useless columns, blind arcades, or common geometrical forms, when it had much better be left plain, if fine sculpture cannot be afforded to enrich it. There was something to be said for the geometrical patterns of the Saracens, but they not only appear to be insoluble, but the Moslems were discouraged from using figure sculpture.

To continue the account of the Roman revival in Renaissance days, I may say that so long as Roman work was used to add interest, novelty, and style to the forms in use, the work had ways some charm; but when the architects of the latter part of the fifteenth and the early sixteenth century had got a recipe for Roman architecture, its use was mainly a

proof of study and a good memory, it ceased to be interesting. The same thought which induced Serlio, Palladio, and Vignola to publish measurements of the ancient Roman buildings and correct specimens of the orders, and to recommend their use, occurred to the Irishman, if an apple-pie was made so delicious by a little quince, how delicious would it be, if it were all of quinces. Gradually architecture became a scholastic exercise in a dead language, in which false quantities were a graver offence than the want of proper expression or invention. At last architecture became the dullest sort of pedantry, when it did not fall into contortion. An architect may be allowed to use a Classical column, even with the perfect Classical proportions, if those proportions are wanted to carry the weight; but as this use of it would require nothing but a little statical knowledge, it must be looked on in the same light as a quotation by a modern poet from the classics, not quoted for the sake of letting the poet's memory serve the turn of invention, but to show his admiration of the gem, by setting it. All columns, however, should be excluded that were not wanted to carry weight; and even for these an architect should generally be recommended to use some new or elegantly altered form that would attest his originality.

John Addington Symonds, after stating that the Renaissance architecture created a new common style for Europe, makes the following prophecy:—"With all its defects, it is not likely that the neo-Roman architecture, so profoundly studied by the Italians and so anxiously refined by their chief masters, will ever wholly cease to be employed. In all cases where a grand and massive edifice, no less suited to purposes of practical utility than imposing by its splendour, is required this style of building will be found the best. Changes of taste and fashion, local circumstances, and the personal proclivities of modern architects, may determine the choice of one type rather than another, among the numerous examples furnished by Italian masters. But it is not possible that either Greek or Gothic should permanently take the place assigned to neo-Roman architecture in the public buildings of European capitals."

Granting his assumption, that architects must copy something, I agree with him; but I do not grant his assumption. If I did, both this and the last course of lectures would have been time wasted, both for the speaker and for his hearers. I say that architecture is an organic art that must change with our knowledge and skill in construction, more particularly when we have materials of vast power scarcely known to the ancients. I say, too, that we have new tastes and different emotions to express. We must learn from the past the language of architecture and the methods by which emotion has been produced, and, when this language and these methods have been learnt, we must all try to express the emotions of our day. If emotions be but feeble now, the time may come when they will be stronger and when they will be more earnestly desired.

There have been some great movements, even in my time, that I hope promise well; one certainly does—the pursuit of truth. Speaking of the intellect, the pursuit of truth is now getting to be looked on as man's highest duty, and we shall eventually have temples to it. We are also coming to believe that the investigation of the laws that govern the world and those parts of the universe that are within our ken, are the most valuable parts of knowledge. Few will dissent from this opinion, for the slight glimpses we have gained have not only made us like the fabled magicians of old, and cut us adrift from the past world, but have added enormously to our power, our comfort, and our wealth.

The putting the keys to knowledge in the hands of the rising generation must have striking results, and the passing of every child through the Board School sieve, and making what openings we can for those specially gifted to use their gifts must, if not mismanaged, greatly add to the effective power of the country. Democracy, again, is a vast power, which we hope the sagacity of the nation will direct in the right way. One cannot help thinking that workmen will learn that they cannot raise their wages by being idle, nor by destroying the wealth of the country, and may, therefore, use the wealth they now squander in strikes, for building themselves magnificent halls which will throw the Halls of the Confraternities (Scuole) of Venice into the shade. We may also hope that moral philosophy will be greatly extended on a new basis, and that the multitudes who go to learn its lessons may desire to be housed conformably with the importance of the subject; and, lastly, that our legislators may learn that the most striking lessons

can only be given to the bulk of men by the fine arts.

Something must be said about sculpture, and by sculpture I mean what the French mean, viz., the carving well of vegetable or animal forms, as well as the human figure. I presume it to be admitted that the Egyptians carved animal forms in the most monumental way. The purely natural forms of the animals have been so abstracted or modified by them as to make them perfectly harmonise with the monuments they adorn. The Assyrians doubtless gave the most vigorous and lifelike representation of animals, but they do not so well harmonise with monumental structures. In the case of man, the Italian Renaissance masters undoubtedly added new phases of treatment. There is a peculiar charm about their naked children which is quite different from that of the Greek sculptors or their Roman imitators; and some of the greatest of the Renaissance masters gave a mystery, a look of passion, or of Christian resignation to the human face, which was not found in antique sculpture. The helmeted figure in the Medici Chapel, by Michelangelo, is perhaps the most striking example of inscrutable mystery.

Though there are, perhaps, no examples of Renaissance foliage that are quite equal in monumental expression, in dignity and simplicity of treatment to the very best Roman work, there was a greater look of vitality, and greater invention amongst some of the best Early Renaissance work. I should hardly like to affirm that the very best Renaissance sculptors excelled in perfection of treatment one or two examples of the best Roman work, except, perhaps, in the very flattest kind of bas-relief; but there are, undoubtedly, hundreds of examples of Renaissance work that were superior to Roman, for these Italians of the valley of the Arno were much greater artists than any Roman. But what is to be found fault with in the Renaissance is the feigned admiration for griffins, gorgons, and chimeras, sacrificial instruments, and skulls. The club of Hercules and the lyre of Apollo did really appeal to Roman sentiments and beliefs, but with the Italians it could neither recall the same belief nor the same sentiment; they were like the bull's heads we now see on Banks. The Renaissance men were merely trying to think that they loved these things; just as the modern imitators of Gothic try to fancy that they love ill-modelled Gothic images better than the most perfect sculpture of the beauty or vigour of the day. If architects are content to be the mere decorators of buildings somebody else has constructed, then if they are to do it well they must proceed in the same way that the Renaissance men did. They must first apprentice themselves to working goldsmiths, then become sculptors, and afterwards learn the few architectural rules that are wanted for architectural designers. As far as floral ornament is concerned, the modern sculptor architects must learn to love something, and to treat it with the same mastery that the Greeks treated the honeysuckle or the Romans the acanthus. I think it is impossible for any large number of architects to become sculptors as well as architects if they desire to practise architecture as a structural and progressive art. We not only find that the devotion of a lifetime is wanted to make figure sculptors eminent, but even to produce admirable ornamentalists. Hence we conclude that unless an architect has that wonderful and many-sided capacity that characterised Alberti, Leonardo da Vinci, Michelangelo, or Wren, he can scarcely hope to be a master in his own profession and to rival the sculptors and ornamentalists in theirs.

It is said by many that if architects cannot equal the works of the past ages in a new direction, the best thing for them and for the public is to copy or closely paraphrase past works. If the architect is really the poet of building, he must by so doing necessarily lose that appellation—he ceases to address his generation in language that moves them. He is no longer an original poet, but a copyist, or a paraphraser. The poet who merely paraphrases Milton, Dryden, Pope, or Tennyson, although he would be as sure as the architect is to add certain elements which belong only to his own day, could not be looked on as a poet, but only as a skilled workman who creates no emotion. He would merely be said to be a good paraphraser of Milton or of one of the rest. You may be sure that every poet, to say nothing of every great poet, has paraphrased the best pieces of the great poets with whose language he is acquainted. He may even, and probably has, quoted from some of the best; but the bulk of his thoughts, his emotions, and his style must be of his time, his nation, and himself. You cannot teach this gift. All that you can do is to



teach the rules of the art, so as to render the man capable of expressing what he has to say. If he has nothing to say, but is the master of the art of speaking; well, you can only call him a stylist. One of the main objects of these lectures has been to stir the emotions of those who feel that they have something to say in architecture, and also to recommend the methods of learning expression, and of pointing out some of the ways in which a certain divergence may be made from previous work. Even cookery, in its higher form, cannot be taught by recipe; but a very commonplace person can be taught to make things more or less palatable and digestible, which his own unaided intelligence would never have enabled him to do. It is not so very uncommon for the deep study of a subject to reveal to the student, powers in that direction that he never suspected; although I think that this can rarely be the case with those of the greatest capacity. I am inclined to think with the French poet, "that the thorn that does not prick when it is born, will never prick at all." If this were not so, we must have lost the creations of very many geniuses.

#### ROYAL INSTITUTE OF BRITISH ARCHITECTS.

The ninth meeting of this Institute for the present session was held on Monday last, at 9, Conduit-street, Mr. J. Macvicar Anderson (President) in the chair.

The President stated that, as intimated at the last meeting, Mr. Middleton had resigned the post of auditor to which he was elected. It was, therefore, necessary, under the terms of the by-law, to elect an auditor in his place.

On the motion of Mr. William Woodward, seconded by Mr. H. Burrows, Mr. F. W. Marks (Associate) was elected auditor.

The President next announced that an Intermediate Examination, to qualify for registration as student, was held on the 20th, 21st, and 22nd inst., when thirty-eight probationers applied, thirty-six of whom were admitted, and of these thirty-five presented themselves and were examined; twenty-one passed, and twelve were relegated, in three, four, or five separate subjects, and two in all subjects. The majority of those relegated failed in subjects two and four, viz., "the several varieties of Classic ornament" and "the characteristic mouldings and ornament of each period," in which accuracy of delineation was indispensable. No one need feel disheartened at being relegated; on the contrary, it was found by experience to be of the greatest possible advantage to the students that they should be relegated, because they "had thereby the opportunity of making themselves much more acquainted with the subjects than they were before." The twenty-one who had passed, placed in order of merit by the Board of Examiners, were as follows:—C. F. Innocent, Sheffield; G. Thomson, Leeds; J. Hunt, 18, Dorset-square, N.W.; H. A. Chapman, Scarborough; P. C. Blow, St. Albans, Herts; R. H. Owen, 293, Clapham-road, S.W.; C. O. Nelson, 16, Scarsdale-terrace, Kensington, W.; L. B. Price, B.A., Oxon, 64, Cannon-street, E.C.; S. Owen, Newholme, Grappenhall, near Warrington; G. H. Devall, Birmingham; H. Shepherd, Richmond, Surrey; R. H. E. Hill, 3, Lombard-court, Lombard-street, E.C.; C. W. Harris, Liverpool; H. M. Potts, Newcastle-on-Tyne; G. H. Grayson, Liverpool; A. Harrison, Stockton-on-Tees; P. C. Newman, 33, Cologne-road, New Wandsworth, S.W.; W. R. Mosley, Leeds; E. C. Aldridge, Liverpool; R. Rich, Newcastle-on-Tyne; E. Borissow, Cambridge.

Those 21 probationers who had passed, added to the 15 who passed in November, increased the number of the students of the Institute to 109.

#### The New Science Laboratories at University College.

Papers were then read on "The New Science Laboratories at University College, London," by Professor T. Roger Smith, Professor T. Hudson Beare, B.Sc., M.Inst.C.E., Professor J. A. Fleming, M.A., D.Sc., F.R.S., and Professor G. Carey Foster, F.R.S. The papers were all read by Professor Roger Smith, the first being his own. The object of the paper was to describe the additions and alterations which had recently been carried out at University College, London, in order to form a series of laboratories, buildings devoted to the practical study of science and applied science, sufficiently extensive and complete to be worthy the attention of members of

the Institute at a time when technical scientific teaching was one of the prominent subjects of the day. The first engineering laboratory set up in the United Kingdom had been that established by Professor Kennedy in the year 1878 at this College, in a basement not well lighted, certainly spacious, but with no other special adaptation to the purpose than that it had a solid floor; and most of the numerous engineering laboratories which had been since established had far better buildings provided for them. It was for the many students now working in this department, which had thriven exceedingly, that a new and suitable laboratory, together with a spacious and light studio for mechanical drawing, was urgently required. The departments of electrical engineering and physics also required better accommodation. No unoccupied land remained at the disposal of the Council on which a building supplying what was required could be erected, except a small part of the south quadrangle in the rear, and the space along the western or Gower-street front of the great front quadrangle. The new physical laboratory, which, however, furnished only a small part of the accommodation needed for physics, was accordingly erected in the rear, and to the electrical and engineering laboratories part of the front space was allotted. Designs were made providing for the largest amount of space compatible with retaining an adequate opening in the centre of the new front; and of these Mr. Brewer had made two views, which gave a general idea of what was contemplated. Very nearly the whole of one block occupying the southern half of the long frontage had been commenced in order to afford as much ground-floor space as was wanted; but, unfortunately, on the part of the upper floors was called for at the time, and financial considerations absolutely prohibited anything more being done than it was essential to do, with the result that much of the building was temporarily roofed in as a one-story building, so that externally the new laboratories looked very unfinished indeed; but each of the departments actually constructed had been entirely completed internally. In the architectural treatment of the building the details of the original had been most scrupulously followed, and towards the quadrangle the original ordonnance was in every respect continued. Towards Gower-street some small variations of great practical utility had been made, the most considerable being the introduction of a third story of openings along part of the front. The engineering laboratory consisted of a building 98 ft. by 50 ft. internal measurement, with four small rooms cut off from it at the north end, and a large space for the steam-engine enclosed by a glass partition, the remainder being quite open and full of machinery and tools. The walls were lined with white glazed bricks. The laboratory was covered by a very light temporary roof of steel trusses, slated on boarding and felt, and with a sky-light.\* The floor was of wood-block floor on concrete, and where the lathes and other large tools come, blocks of cement concrete were put in to receive them. Cast-iron brackets to carry shafting were built into the walls, and gas, water, and electric light laid on. There was no basement under the adjoining. In this basement level there was a forge, and at the basement level, but not under any part of the building (so as to avoid any possible risk to the fabric from explosion), was formed the vault for a boiler-house. Also in the basement, but extremely well lighted, owing to a fall in the ground, was a large carpenter's shop, available for all the engineering students. In the basement there were also lavatories and a heating chamber. As the management and testing of the boiler was part of the training of the students, a spiral staircase connected the boiler-house directly to the laboratory. On the first floor, over the electrical department, a lecture theatre and a class-room and professor's private room were provided. Behind the lecture theatre a large diagram-room had been formed, and adjoining it was a dark room with a dark ante-room to all these rooms. The whole of the second or topmost floor was devoted to engineering-drawing, and graphics. In the lecture theatres the floor was flat, which he personally considered undesirable in a lecture theatre, but which the professors who used it desired. The rows of seats for students were straight, and not arranged amphitheatrically on plan. Experience showed that this answered best. The southern

half of the ground story was dedicated to electrical engineering. Here, thanks to the good judgment of Professor Fleming, who knew exactly what provision he wanted, they had been able entirely to avoid corridors, except one short length of entrance corridor and lobby leading to the door of the engineering laboratory and to the staircase. Three divisions occupied the space: (1) The electrical laboratory at the south end, large and very light room; (2) the lecture theatre with its apparatus-room; and (3) the dynamo-room. It was quite true that the lecture theatre formed a passage room, but this arrangement Professor deliberately adopted as consistent with the manner in which he would work his department, and it had helped in the elaboration of a very compact plan. In the laboratory, in order to secure quietness and to keep out the dust, the windows were double, and blinds which would completely shut out the light were fitted to them. Some difficulty was experienced in obtaining material sufficiently opaque; but an admirable dense fabric was at last supplied by Messrs. Guynan, known as "opaque" cloth, and specially prepared for such purposes. Strong and thick stone slabs for tables were built into each pier at about table height, and formed steady tables to carry various measuring instruments. Similar slabs were provided in the north wall, and all windows had them in place of the usual window-board. This had been found to be an excellent way of obtaining a perfectly trustworthy support for delicate apparatus. The lecture theatre had an apparatus-room lit by electric light quite close to the lecturer's platform, and the channel for conveying wires to the laboratory passed absolutely under his table, so that any connexions required for lecture purposes could be made with the utmost facility—indeed the keynote of the whole disposition was that the Professor at his lecture-table had his whole department round him, and could literally touch the wires leading to and from everywhere. Even the darkening of the windows of his lecture-room could be done from the table. Adjoining was the dynamo-room, where the electricity is generated. The floor of the dynamo-room was a most important part of the structure. After a good deal of consultation the following mode of construction was adopted. After excavating the solid earth to the required depth a mass of 2 ft. of Portland cement concrete was laid over the entire floor, with an extra depth of 6 in. at the bed of the gas-engine; but it was prevented from touching the walls anywhere, and was 2 in. being left clear all round, which was afterwards closely packed with slag wool. In the concrete were embedded the anchor-plates of iron holding-down bolts, and in order to secure the absolute accuracy of their position a skeleton template of the whole floor was prepared. In the help of these bolts a series of teak beams, each 6 in. by 4 in., of a dovetailed section, were secured on the upper surface of the concrete, 18 in. apart; the spaces between the teak beams were then filled in with granolithic cement slightly channelled on the surface, to assist in the running off of water. A 6-in. channel was left almost a round the room for electric light mains, and was provided with a teak cover. On the teak beams the engineers found fixing for their machinery, and could readily change its position if necessary. The accumulator-room was an important part of an electrical installation, and as the storage batteries give off acid fumes, its ventilation was a matter of importance. It was placed in the basement, and they arranged to bring the chimney flue from the furnace of the hot-water apparatus close to it; they carried up a separate air-flue with an inlet at the ceiling-level of the room to be ventilated, alongside of this furnace-flue, and, thanks to the fact that the flue was a high one, and to the stimulus which the draught in it received from its neighbour, they had set up a very efficient out-going current which carried off any unpleasant smells very briskly. The staircase had been constructed with an open well-hole from bottom to top, and a girder had been thrown across it at the highest ceiling-level, so that experiments on long wires or cords might be carried out. It was constructed of Walker's artificial stone, and one of the steps, formed with a small steel joist as a core, was tested by building it into a solid wall and weighting it heavily at the end, and was subsequently destroyed by dropping heavy weights on to it from a height. Its endurance before cracking showed very considerable strength, and the stubbornness and tenacity which it exhibited after its first crack, and before it was finally destroyed, gave him a very high opinion of the value of this material for the landings and staircases of a public

\* If this skylight is essential for the light at present, how is the same light to be provided when the upper stories are added?—Eds.



building. The walls generally were executed in brickwork in cement, the bricks being Fletton bricks, faced with Portland stone, and they stood on Portland cement concrete. The roofs were slated. Fireproof construction was not judged necessary in the floors, which were carried on steel girders. The large department of physics consisted partly of the old engineering laboratory, and the first-floor rooms and lecture theatre above it, all being altered and recast, and partly of a new building on the ground level connected to both floors of the adapted old building by a covered way, which had been already alluded to. The chief interest to an architect of this part of the work lay in the degree in which it was possible to improve the lighting of what had hitherto been a dark—or at best a very unequally lighted—department. In several places it was possible to enlarge the window openings by lowering the sills. In most it was found possible largely to increase the access of light by playing the window-heads outside or the jambs inside, and as the walls were very thick, a really remarkable increase of light was obtained. To a great extent the old walls were refaced with white glazed tiles instead of plaster, and where new walls were built they were faced with white glazed bricks, and the result of the two operations had been to secure an increase of light which added to a remarkable extent to the serviceableness of the buildings. The new laboratory was a simple brick building, with a few mouldings executed in moulded brick round the openings, and many windows. It contained on the ground story two large laboratories and a central room. On the first floor there was one room and a photographic dark room completely fitted up. It might be noticed that a long stretch of space could be obtained against the rear wall by setting open the doors, and that a window occurred at the end of such space. This had been arranged to admit of experiments on rays of horizontal light of considerable length. All round the walls solid stone tables similar to those already described were built in, and gas was taken to every part of the building. The floor was laid, resting on the earth, and was happily remote from any causes of disturbance. The floor of a large laboratory in the basement story of the old building was also practically a solid one, but formed specially, since the earth had been a good deal disturbed. Sleeper walls at a distance of 6 ft. apart were carried from end to end of the laboratory, carrying stout stone curbs, the top of which was flush with ordinary wooden flooring. The working tables were all constructed with legs of such a space apart as to rest on these curbs, while the students and assistants stood on the wooden flooring between, and in this way the steadiness of the tables was secured. The heating of the new physical laboratory was carried out by means of the Falkirk Iron Company's controlled combustion stoves, and by open fireplaces in the smaller rooms. The rest of this department was heated from the low-pressure system, which warmed the college buildings generally. In the new wing it was decided to employ a "medium pressure" apparatus, and though his prejudices were not in favour of this method, he was bound to admit that the ease with which it could be introduced into every part of the building, and the large amount of heat which it threw out, were very much in its favour. All the three new departments were lit by electric light. The fittings used in the engineering department were for the most part the old ones, and required no special description. The desks in the lecture theatre had been newly designed, and were arranged so that each student had a separate desk large enough to make small drawings in addition to taking the ordinary lecture notes, and so spaced as to give the professor ready means of supervising the drawings. In the electrical department the fittings were almost entirely new. In the photometric gallery a railway was formed for moving the light to be tested; this was 22 ft. long, and carried on fir bearers. The rails were 6 ft. apart, and formed of rails out of 5 in. by 2 in., with 1 in. square chromized mahogany strips glued and tongued on the upper edge, and the whole painted black. The distances representing candle-power up to 100 had since been calculated and painted on the lecture theatre the ordinary slate or black-board had been replaced by one of plate-glass, with a ground surface for drawing on, and backed with black cotton velvet. The lecturer's table in the electrical theatre was somewhat elaborate, and was specially arranged with a view to easily controlling the various currents obtained from the cells. In addition to four

cupboards, two of which contained all the terminals, and the nest of drawers under the top, the centre portion was left quite open, and at each end a broad recess 8 in. deep was formed, and the cables from the accumulator-room, which was situated immediately below, were brought up and placed directly under the Professor's control. The fittings of the physical laboratory were mainly those already in use. If the buildings and fittings were adapted to their purpose it was very largely due to the fact that, from first to last, they were in constant communication with the Professors who were actually working in the old quarters, and were to occupy the new. An architect so placed enjoyed an advantage which, when he was preparing competition designs from a printed programme drawn up by strangers, was totally denied him, and he had in no instance been more sensible of the value of this sort of co-operation than in the present one, when he had worked in concert with his three colleagues, Professor Carey Foster, Professor Fleming, and Professor Beare.

Professor Roger Smith then proceeded to read papers on technical details connected with the fittings of the various departments (or such portions of them as there was time to read), by Professor Carey Foster, Professor Fleming, and Professor Beare. It would be of no use to attempt to summarise these papers, and to give them in any detail would be unfair to the claims of the Institute in their copyright. The whole form a very valuable repository of information and experience as to the machinery and fittings required for technical laboratories, brought up to date by scientific experts who are thoroughly acquainted with their subject.

#### Discussion.

Mr. Gordon Smith said he would not attempt to discuss the details of the learned papers they had just heard. He confessed it was beyond him altogether. At the same time, he could not but admire the skill with which Professor Roger Smith had concentrated such a deal of useful accommodation on a site which he must have felt to be very confined. He noticed that the Professor had expressed his conviction that a flat room for a lecture theatre was not the best, but his colleagues in the undertaking appeared to have preferred it. He could not help sympathising a great deal with what Professor Smith had said, that for demonstrations at a lecture theatre and so on it was best to have a rising audience, in order that they might have a better view of what was going on at the table. He felt sure that the materials thus placed on record, in the Transactions of the Institute, would be of extreme value to many architects who might be called upon to design the various Technical Schools and centres of education which were being put forward throughout the country. He had, therefore, pleasure in moving a cordial vote of thanks to the four gentlemen for their papers.

Professor Kerr seconded the vote of thanks. The papers which had been read and the illustrations presented showed in a striking manner what had to be done in the way of complicated arrangements by the architect nowadays, under special circumstances. Professor Roger Smith and his colleagues had, to all appearance, produced an exceedingly complete and serviceable design in every respect. They, as architects, must see that this was but one of many illustrations of the necessity for carefully considering of the interior economy of their buildings. Some of them were old enough to remember the time when a building of this sort would have been designed in a Classical manner, and constructed in a very substantial way, while the Professors of the several departments would have been allowed to settle down and do as they best could. That state of things was no longer tolerable, and he presumed that the colleagues of Professor Roger Smith had been personally required to instruct the architect in all the minutiae of their paraphernalia. So it was with architecture now-a-days in its practical form. Those of them who were young men must look forward to the fact that, in a practical country like this, and a country which was becoming more practical by absolute necessity, in respect of science, art, and other considerations, the public would require from the architect the utmost possible skill with regard to internal organisation. He therefore thought that the illustration here afforded of the painstaking with which this organisation had been accomplished was a most important thing.

Professor Unwin congratulated University College on having been, in past times, the pioneer of some branches of scientific education, and on

having brought its engineering school and equipment up to the level of some of the more modern institutions. If he might offer one slight word of criticism, it would be in regard to Professor Roger Smith's statement as to the engineering laboratories established at University College being the first ever established in this country. There was a distinguished professor of engineering at University College, he believed, from 1847 to 1855, Professor Evan Hodgkinson, than whom no one had done more for the establishment of experimental data in connexion with engineering. Professor Hodgkinson made his experiments at Manchester, and he (the speaker) succeeded, in 1855, to the use and care of the Professor's instruments, and for ten years after that specimens of iron, steel, timber, and stone came from various parts of the country to be tested. The special merit of University College was that it had opened a laboratory in connexion with an engineering school, and this was a very meritorious achievement. It was almost a defect nowadays that the laboratories were taking too much of an identical form; and it would be preferable if, in different laboratories, certain directions of work were a little more specialised. In the arrangements of the equipment of the school at University College, he thought the workshop took rather too subordinate a place. Experience had shown him that the workshop was a very important part of any modern engineering school, and in giving expression to that view he believed he was in accord with the universal experience of America, where the schools were on the whole better equipped, and where the workshop took an important place in the college.

Mr. H. H. Statham remarked that this was an architectural society, and he hoped they would not separate without something being said from the architectural point of view. It appeared to be forgotten that the Professors of University College were in possession of a building by an eminent architect, which was one of the ornaments of London, and he had heard no reference whatever made to what was the original design of the building, or to the extent to which that design had been considered, except the one remark that the internal ordonnance of the quadrangle had been carried out. He did not believe Wilkins ever intended that such internal ordonnance should be carried round the front at all. He had challenged Sir Douglas Galton in the *Times* to produce any evidence of it, but none was forthcoming. There was, however, in the library of the Institute a small old-fashioned engraving, which was marked as "Design accepted by the Committee for University College," and, although it was a poor thing as architectural drawings now went, it was quite easy to see what Wilkins's intention was. The north and south wings were to be brought up to the street; they were to be connected by a low ambulatory of one story, and the fronts to the street were not to be treated with flat pilasters as in the design now exhibited; the front was to be broken, the centre part being brought out, and the upper portion to be a portico of four columns. It would be clear to every architect that Wilkins's idea was that these porticoes were to be a kind of echo or balance of the centre portico. He was not so bigoted as to say that, when the college wanted more room for their workshops, they were not to consider the matter; but he thought a little better attempt should have been made to carry out the feeling at least of Wilkins's design. At all events, they might have heard some reference made to that point, and some regret expressed at the apparent necessity of spoiling the work of an eminent architect, and of depriving that part of its finest objects and of an open space that could ill be spared. On the day when these laboratories were opened, Mr. Horsburgh, the secretary, told the reporters that it was a mistake to suppose the quadrangle would be enclosed, and that there would be a space of 100 ft. left in the centre. He would like to know from whom that statement first emanated? He had looked at the place, and a single glance showed him that there could not be half that space, but he had also had it measured, and he would like to draw the attention of the meeting to one or two figures. The length of the new wing, when completed, would be 213 ft.; and the length to the central axis of the site was 237 ft., leaving 24 ft. on each side of the centre, or 48 ft. for the magnificent opening shown in the perspective view exhibited. He wished, therefore, to know why the public were informed that there would be 100 ft. there? Then again, the circular



porticos on the plan, which was to be published with the Transactions, projected 21 ft. beyond the line of the main building; which would leave just 6 ft. between them. He would like to know, unless it was proved to the contrary, whether the Council intended to accept that perspective drawing as a representation of fact? He would also put forward the general proposition, that the building had been treated without sufficient regard to its original design, and that the design, as shown, was not such as could really be carried out.

Mr. Elsey Smith said that Mr. Statham had undoubtedly been led into error in his measurements, because he had assumed, as had frequently been done, that the centre of the two porches forming the entrance to the college was on the same centre line as the central portico. That was not the case, there being a difference of 10 ft. between the axis line of the portico and that of the present gateway.\* There was not 100 ft. between the two, and it was never intended there should be, so that he could not understand how any such statement came to be made. At the same time, the drawings shown had been made by Mr. Brewer from actual plans. It was easy to see how Mr. Statham had made this error in the measurement of the front, for no one in looking at it from the street would believe that the axis of the present gateway was not on the axis of the central portico.

Mr. Statham said that the entrance gates were shown central with the axis on the large scale ordnance map, and it was easy to see when one was on the axis of the building by standing on the other side of Gower-street, and getting the position from which the cupola came symmetrically over the columns. He was certain it was not 10 ft. out of the axis, nor anything like it.

Mr. William Woodward remarked that questions of measurement were matters of fact, and could be easily settled. The front to Gower-street was a plain Classic one, and with a due regard, even to the smallest detail, of the original mouldings and design of Wilkins, therefore, as Professor Roger Smith had been commissioned to erect these buildings on a site which he could not enlarge, he had satisfactorily overcome the difficulty. There would only be in Gower-street what was to be seen in Oxford, so that they could go into the quadrangle and examine the objects there.

Professor Capper spoke of what was being done at King's College in the matter of engineering.

Mr. Forster Hayward was aware of the difficulty of working in the details of such a place with the architecture of the building. As an old schoolboy of University College, and as an architect, he was well acquainted with the place before any wings were added to it, and in all friendliness he was compelled to condole with Professor Roger Smith on having had put upon him the necessity of building out the delightful view from Gower-street of the portico dome and building of University College. They must all feel that whatever the exigencies of the case were it would be a great loss to cut off the view from what had evidently been designed to be seen from the street, because the wings were brought up and finished at the ends in the view of Wilkins's original design. The authorities of University College ought to have thought very closely of this before they took up the ground they had done. He would like to know whether it was really impossible to have got one or two of the houses at the back, where the old physical laboratories were at present, and to have added the series of new laboratories there, all connected with the theatres? He should have thought it would have been much better to do that than to bring the laboratories to the front, where there was considerable traffic. A quadrangle, to be worth anything, must be very much larger and deeper, and should have a wider entrance opening than what was now proposed. He hoped the matter would be reconsidered, and that they would not destroy a very important view of part of the architecture of London by carrying out the proposed plan.

Professor Carey Foster said he owed a debt of personal gratitude to Professor Roger Smith and Mr. Elsey Smith for the great trouble they had taken in endeavouring to meet his views in the plans of the physical department of the college. The result was that University College now possessed as good a physical laboratory as any similar institution in the country.

Professor Beare added his testimony as to the great debt of gratitude due to Professor Roger Smith and Mr. Elsey Smith, for the manner in

\* Mr. Elsey Smith has asked us to state that since Monday he has referred to the drawing from recollection of which he spoke, and that he finds that the difference there shown between the axis line of the portico and that of the gateway is 5 ft., not 10 ft. as stated at the meeting.

which they had carried out the design, on the limited ground plan at their disposal. He had now been in the occupation of the block since October, and had found that it met all requirements, besides being remarkably free from noise. The vibration generally caused by machinery was prevented, by having the whole of the concrete flooring separated from the side walls, the space between being filled in with slag-wool or something of the kind. So well had this plan answered that, although the lecture-school was close above the dynamo, there was no noise at all from that source.

The President said it was extremely satisfactory to learn, on the authority of the learned Professor, who had made use of these buildings since their erection, that they answered admirably the purposes for which they were designed. The architectural question was, of course, one of the utmost interest to the profession, and the facts brought forward by Mr. Statham certainly appeared to be very circumstantial, he being a man who was little likely to make such statements without having satisfied himself as to their accuracy. At the same time, he could hardly think it credible that any architect of experience and repute would so set out additions to any important buildings as to produce the result that the buildings on either side of what was intended to be a wide central opening, should be within 6 ft. of touching each other. With respect to the façade, he should have liked, if the opening in question could possibly have been more of the proportions indicated, possibly in error, originally. At the same time, it was only fair to remember that the circumstances of the time when Wilkins designed the building were very different to those of the latter part of the nineteenth century, and had Wilkins known for a moment what the century would produce, he might have indicated a very different plan.

The vote of thanks was then put and carried.

Professor Roger Smith, in acknowledging the vote, said that one point on which he was rather strong was the question of the sloping floor. From experience he had proved that this was best for a lecture-theatre. He had designedly made this a technical paper. It had appeared to him that if the work he had to do had any claim to consideration, it was because scientific pursuits were assuming great proportions, and that he was able to furnish a certain amount of information, which would be useful to his colleagues, as to what was necessary in a well-equipped scientific laboratory. He had felt the responsibility of dealing with the architectural claims of University College, but he might be allowed to say that, when the undertaking was started, several members of the building committee, who were Oxford and Cambridge men, wished to enclose the quadrangle entirely. He was bound to say that he considered a building which was entirely a quadrangle had a dignity that a three-sided building did not possess, and he was not at all sure that University College would not have gained rather than lost, supposing that course had been pursued. At the same time, he had fought rather hard for the retention of the central opening, and what had been arranged was the result of a compromise. He would be only too glad if the gap were wider than was shown in the plan, and there would be no difficulty in finishing the building at the point where it now was.\* But he entirely disclaimed that they had spoilt the building by shutting it in. No doubt, as viewed from Gower-street, the splendid portico and steps were better seen than they would be when the building was completed; but the demands for accommodation were imperative, and he believed that, at no distant time, it would be necessary to carry out practically what the drawings show. Perhaps when Mr. Statham next went that way, he would be kind enough to stand before the two porches, and he would then find that the centre of the Hospital was not opposite him. The Hospital was, no doubt, set out truly opposite to University College, and it would be found that the central doorway of the Hospital did not face one when he stood between the two porches. (Mr. Statham—"I noticed that.") In conclusion he would say that he admired Mr. Statham for the interest he took in this building, which was one of the architectural bits of London. If Mr. Statham had been led to push his view rather more strongly than he (the speaker) would have liked, at the same time, he quite recognised that there

\* Professor Smith has asked us to add the following note to his remarks:—"Were the present building finished at the point which it has now reached, and a corresponding length given to the north block when built, the space between these blocks would approximate very closely to 150 ft., a circumstance which, no doubt, has led to that dimension being mentioned in connexion with the gap."

were few men who had any zeal for architecture, or who were in the position Mr. Statham enjoyed, of being able to say a word in season which could be heard by the public with regard to architectural buildings. He quite recognised that duty often called upon Mr. Statham perhaps more than most people to be a jealous guardian of architecture, and he was well aware that the *Builder* had in countless instances done good service in that respect.

The President announced that the meeting on March 12 would be a special one, for the election of the Royal Gold Medalist for 1894, followed by a business meeting for the election of candidates as Fellows and Associates. It was proposed to devote the remainder of that evening to the consideration of the Bill now being promoted by the London County Council on the Streets and Buildings of London.

The proceedings then terminated.

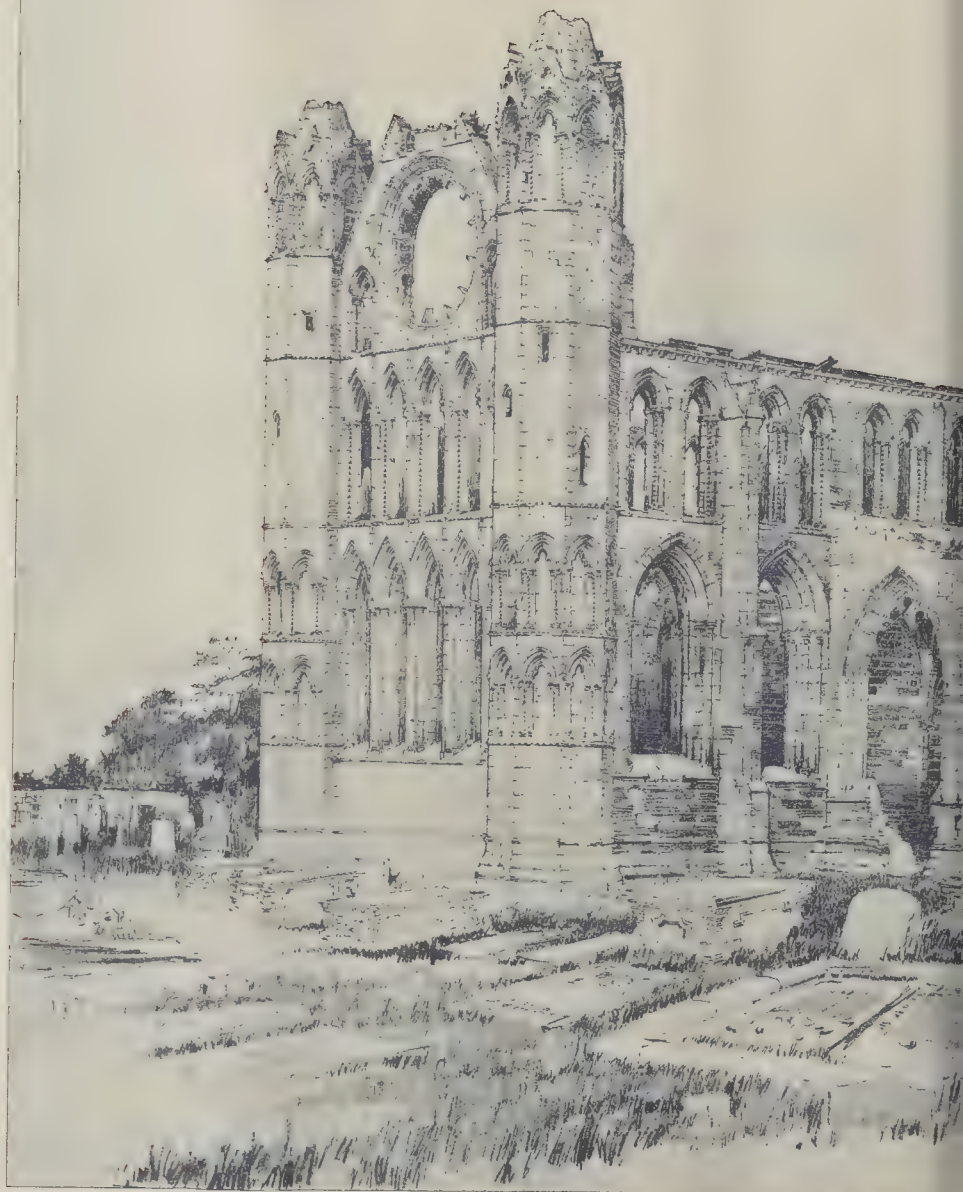
[As the correctness of my statement in regard to the alignment of the new buildings has been denied, I requested Professor Henry Adams to ascertain with a theodolite the point at which the axial line of the portico of the old buildings cuts the gateway in Gower-street, and the distance from that line to the break in the wall of the new buildings. I gave him no hint of my own measurements. The testimony of the theodolite is that the axial line of the portico cuts the gateway not 10 ft. to the north of its centre as Mr. Elsey Smith asserted at the meeting (an assertion the absurdity of which would be manifest at a mere glance at the place), but 7 in. to the north of it. As I had estimated by the eye that it was slightly south and not north of the centre of the gateway, Professor Adams's measurement from the axial line to the break in the new building is therefore naturally 1 ft. greater than mine; 62 ft. instead of 61 ft. It follows, therefore, that the block plan which I exhibited to the meeting, to show how much space would be left between the two new wings if they were built symmetrically in regard to the axial line of the portico and cupola, is substantially correct, the only difference being that there would be 8 ft. left between the semi-circular porches instead of 6 ft. As the perspective view published in the *Journal of the Institute* shows a double road-gateway with a pretty wide iron standard in the centre of the road, and room for two cabs to pass at each side, some idea of the extent of its inaccuracy may be formed. Professor Roger Smith is wrong about the Hospital doorway also, as he might have seen by merely standing in the centre of the hospital steps, and looking at the pediment and cupola opposite, when he would have seen that they were out of line from that point. Professor Adams finds that the axial line cuts the bottom step of the Hospital doorway 1 ft. 9 in. from its south end, which (as the step is 10 ft. long), makes the Hospital 3 ft. 3 in. out of line with the College. Professor Roger Smith will perhaps now perceive that he had better have known more about the alignment of his own building before professing to correct my mistakes. Even if he had been right in the assumption that the Hospital and the University were aligned on the same axis, that would not have given him the space he wants by a great deal, and his plan exhibited at the meeting would still have been incorrect—by how much I cannot say, as he has prudently abstained from publishing it in the *Journal of the Institute*. His own assumption on this head may now, was practically a direct contradiction of his son's statement made a few minutes before that the line was 10 ft. to the north of the gateway centre. Mr. Elsey Smith has now, I find, altered this to 5 ft. He will have to alter it a good deal more. His statement seems to have been made on the same principle on which the other answers to my criticisms have been made on behalf of the University College authorities—those of the Secretary at the opening of the new rooms, and those of Sir Douglas Galton in the *Times*, viz., to say something that suited their case, whether true or not, in the hope that people would believe it.

I now wait with some curiosity to see, first, whether Professor Roger Smith still means to maintain that his plan and his perspective view give a true representation of facts; and secondly, what apology a young man like Mr. Elsey Smith intends to make to me for having flatly contradicted me in the face of the meeting with a statement which turns out to be as untrue in fact as it is dictatorial in manner.—H. H. STATHAM.]

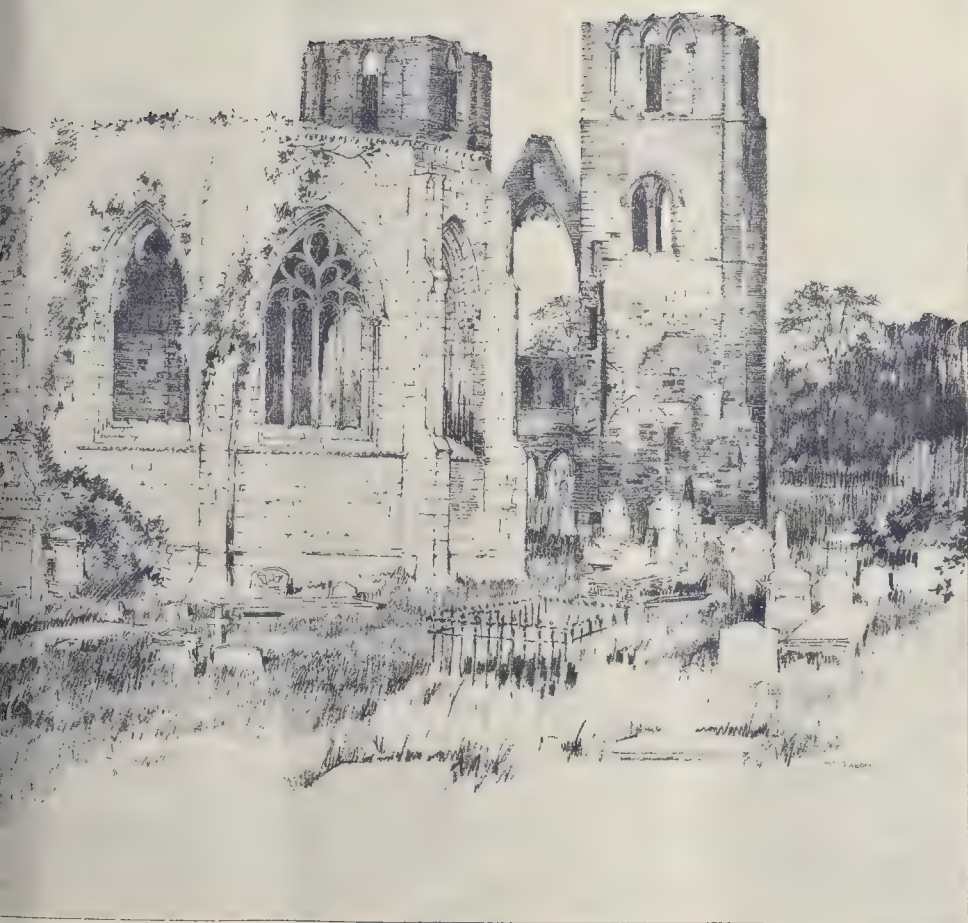
\* I acquit Mr. Horsburgh of any intention to mislead; he no doubt, merely followed his instructions.







THE ANCIENT CATHEDRALS OF

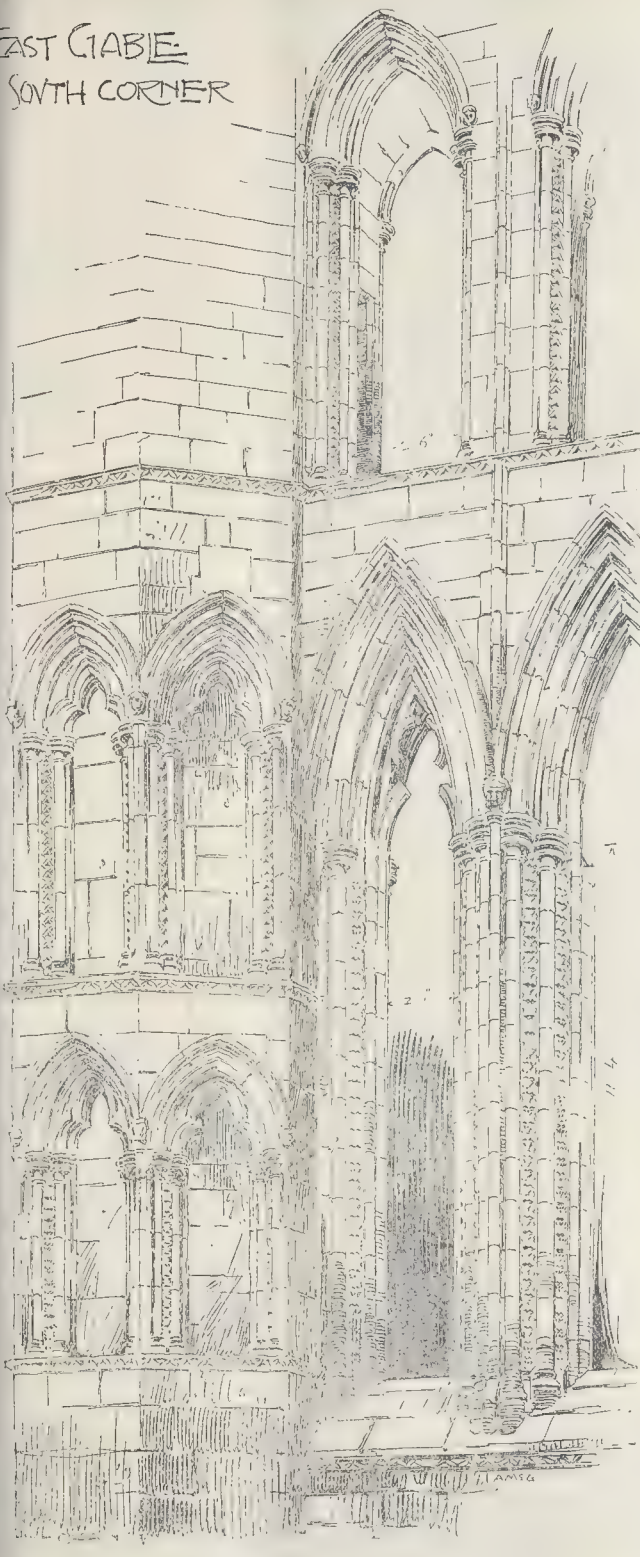


1. A. PHOTO GRAY. E. & C. 18. EAST HAVEN, CT. STREET FETTER, JANE, E. C.

DRAWN BY MR. ALEXANDER MCGIBBON.  
NORTH-EAST.





EAST GABLE.  
SOUTH CORNER

## Illustrations.

## ELGIN CATHEDRAL.

**E**LGIN has been by far the richest and the most complete of the Scottish Cathedrals. In length, inferior to several, but possessing unusual width in its five-aisled nave, an arrangement elsewhere met with only at Chichester—and there only to a limited extent—there must have resulted an appearance of great spaciousness. Unfortunately this most distinctive feature of the building is now hardly realizable, for it is the nave that has most completely perished. The greater portion of the cathedral has been built at one period; a feeling of unity is the result, and the various additions have only helped towards the completion of a typical cathedral plan.

The earliest part is the transept, a single aisle that extends some 20 ft. north and south of the present choir aisles. At the crossing was a tower, ultimately at least, that has twice been built, but has now utterly vanished. The choir has aisles for five bays of its length; beyond these it extends for two bays and terminates in a rich gable, with two tiers of five lights and a large rose window over all; at the gable angles are octagonal turrets. North of the church is an octagonal Chapter House, whose vaulting springs from a central shaft. The nave is of six bays, in length but little exceeding the breadth across the double aisles; each double aisle was of about equal height, and being separated by only slim piers, spaciousness must have been the effect produced rather than that of long-drawn extent, more commonly aimed at. There are two west towers, reduced now to some 84 ft., originally terminated, we may suppose, by timber spires; between the towers is a fine doorway of two openings. Just adjoining the south tower is the nave south porch.

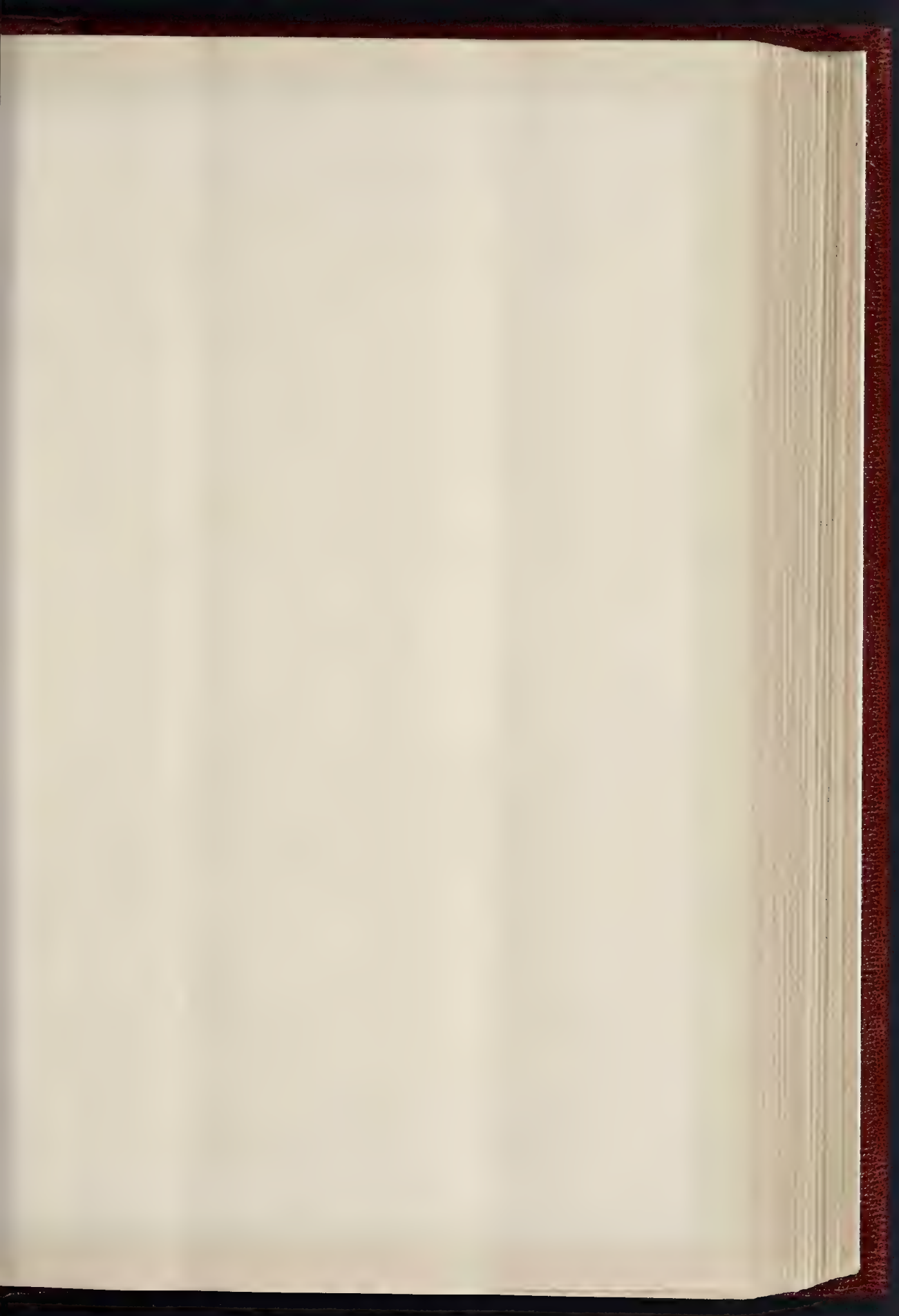
The transept is part of the church of the Holy Trinity that in 1224 was elevated to the dignity of a cathedral. Spynie had for twenty years previously been the seat of the bishopric of Moray, now at this date transferred to suit the convenience of the commerce and the population that centred in Elgin. There appears to exist no history of the early church; it must have been of ample size if its choir and nave were proportionate to the transept that has become incorporated with the later building. In style it is Transitional, and may date anywhere between 1180 and the beginning of the thirteenth century. Pointed and round arches are both used, the earlier form, indeed, is found over the later. At the south porch the scallop may be noted, quite French in effect. The dog-tooth flower that appears there in its largest form, is an ornament that has commended itself to successive builders, for till the latest period, in varying shape and size, it is most plentifully displayed throughout the edifice. The north transept is now levelled to within a few feet of the ground—a catastrophe that befell it so lately as the beginning of the last century. Happily, a record of its appearance is preserved in Sleszer's book, showing it to have been similar to the gable still standing, with three rows of windows, corner turret, and at the gable apex a cusped triangle, just as may be seen has been reproduced in the choir east gable at a later date. That the present length of the nave and the two west towers marks the extent of the first church is not certain, but it appears probable. The width of the central aisle of both choir and nave is just that of the transept; the base of the west tower looks of earlier date than the superstructure—this apart from the difference in the sandstone; above it is the rich yellow variety employed throughout the building. The width of the west front shows it to have been built without reference to the extra wide aisles, and Sleszer's view shows pointed nave arches, with round clearstory windows, as if of Transitional date, and the few bases that remain seem to support the supposition.

1224 is the date of the dedication of the cathedral; twenty years later there is record of some injury, what or where is unspecified; later still, in 1270, Fordun records a fire, and, following thereupon, the laying of foundations of additions. Perhaps the middle date may be applied to the choir central aisle, nave, outer south aisle, and west towers. The three bays of that aisle east of the south-west tower are plainly of the same date as the choir gable, so we must infer that the double aisles from the first had been intended by the cathedral builders, though almost certainly the first church had but single aisles, lining with those of the choir, and so abutting properly within the spread of the two west towers. The rich "skew" of one of the gables of these south aisle chapels is notable;



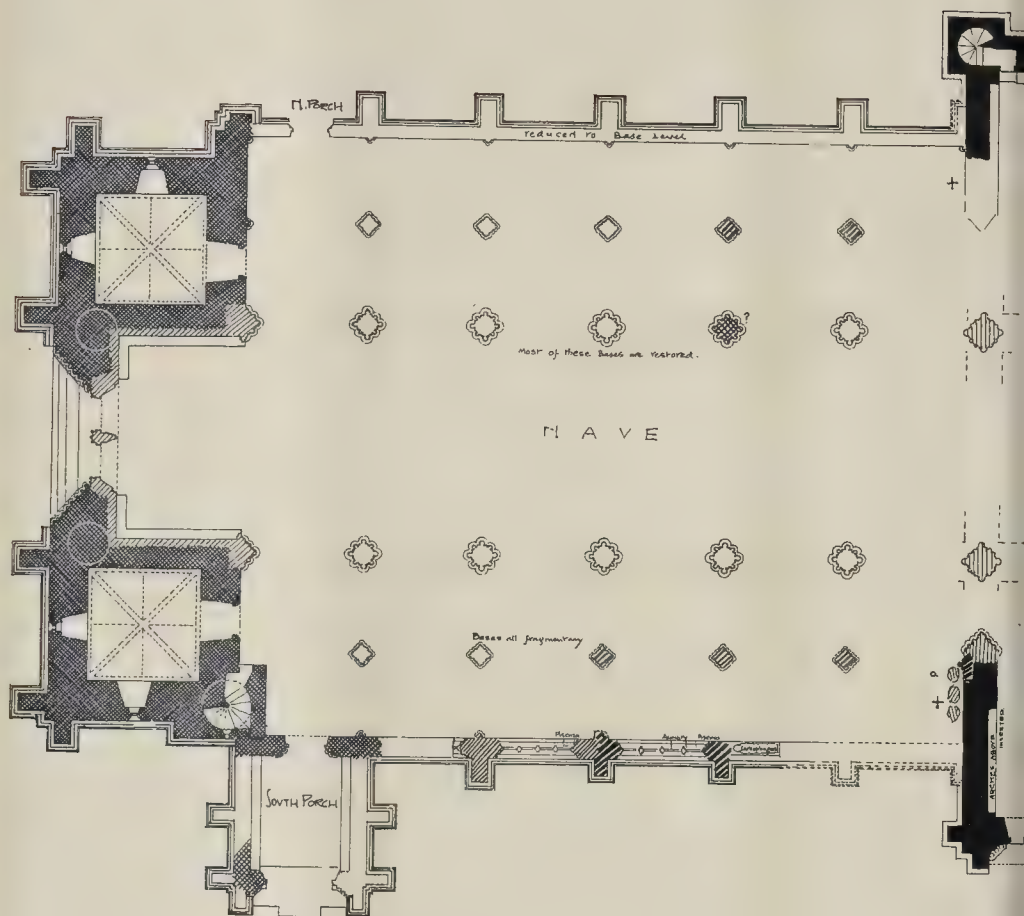
ENTRANCE TO  
CHAPTER HOUSE

it is, however, of later date. In the choir a peculiar feature is to be noted; midway are the responds of what has apparently been intended for an arch to mark the junction of the choir with a Lady Chapel or a Presbytery, but the intention has been departed from, and above the capital the projection works back to the line of wall by a series of crocketed pinnacles. Between these responds and the central tower the choir walls are solid; one opening only has, later, been made to St. Mary's aisle; the north and south aisles were apparently added subsequently. In the choir north wall is to be seen, about the level of a triforium, marks of an arcade, now built up, similar to the one in the west gable over the doorway. 1270 is suggested as the date applicable to the Chapter House, though only the buttresses and lower part of walls remain of the original; this is the date of the fire as mentioned in Fordun, though whether of such extent as to affect the fabric is not stated; so while not exactly assuming that the fire was the cause, such a date seems to suit various parts—the Chapter House, the choir aisles, south-west porch, and perhaps the two buttresses north and south at the east part of the choir.





# :ELGIN: CATHEDRAL

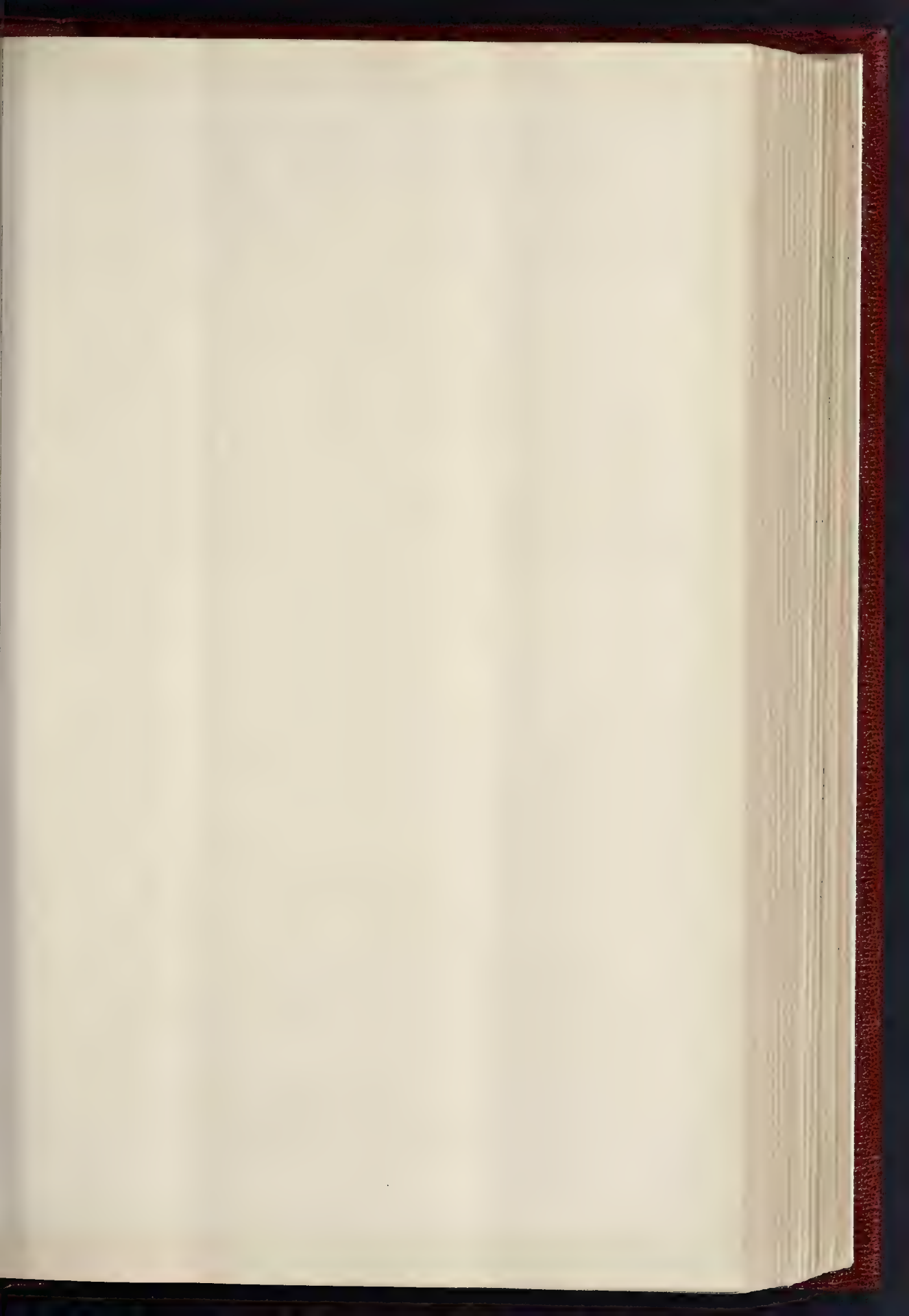


taken from plan measured and drawn  
by Mr. Wm. Tait, Centre, 1871, 1872, 1873













THE VENI

(Published as an Illustration)



34 PHOTO 2000 1 18 EAST HANEN STALL JEFFREY 2000 11

ENICE  
(Royal Academy Lectures)







1390 occurred the burning by the Wolf of Buchan, an Earl of Buchan and son of the king, David II. Little better than a robber chief, he committed offences against the Church dignitaries, and his excommunication by Bishop Barr, was in retaliation, and much to the cathedral was involved; St. Church, the Maison Dieu, and eighteen of the canons and chaplains were slain. The sacrilege excited great horror, and the king, and the ravager submitted to public penance in the church of St. Andrew, Perth, and thereafter by donation of lands and of gold, make some measure of atonement. Obviously, however, the punishment failed of terrorising like evil-doers, and twelve years later another powerful lord, also presuming on high birth—for he was the Lord of the Isles—fell on the church of St. Andrew. The attack, we may believe, was directed against removable valuables, and may have left the building untouched. The Wolf was one of revengeful spirit, and must have damaged the building, though to what extent positively is not known. The Chapter House seems to have

suffered most, and would appear to have been almost wrecked, from the fact that seventy years later restoration required a complete interior casing of masonry, and new windows; the three outer south aisles of nave west of the transept and the west doorway seem all to have suffered—at least, these parts have been renewed at a date clearly subsequent to the burning.

During the episcopate of Bishop Spynie, 1397-1406, the central tower was begun; it may either be that he completed what till then had been unfinished, or that from the foundation, new piers were built. There are other notices of the progress of this work, carried forward by Bishops Innes and Lichtoun, the latter translated to Aberdeen in 1414. However, in 1506 this tower fell, but no cause is assigned for the disaster. In Bishop Columba Dunbar's time, 1422-1435, the west gable had its present large window inserted; as suggested, it may be because of damage done to what had existed previously, doubtless windows in tiers as at the east-end, but perhaps only because of the current vogue in favour of the large single window. This window is noticeable for its acute arch, more pointed than the lancet, unusual in work so late. At the same time the rich inter-

filling of the doorway under seems to have been added. It is a double opening with a vesica panel between, in front of which was a figure, now removed. At the same time the two west responds of nave arcades have been restored, and the decline in grace of moulded profile is seen in the bell of the capitals there, a sharp angle without undercutting taking the place of the usual curve.

On the wall of south tower, facing the nave, are the remains of plastering, and as adjoining fine ashlar work it may be presumed painted decoration was intended.

In 1462 the Chapter House was restored, and dedicated to the Passion, by Bishop David Stewart. A shell of interior masonry was built and new windows inserted; all the tracery has gone now; one was restored some thirty years ago. The south wall alone has not been veneered, and it shows, over the doorway, a row of four arched recesses, once occupied, it is said, by figures of the Evangelists. The centre pier and the vaulting springing from it is graceful, but the carving throughout is indifferent. At the north wall is the dean's raised seat, above is an arcade, omitted on the other sides of the octagon, as if the pro-



jection of the new masonry, that is not carried down to the floor, has been masked by the stalls of the clergy; on the north-west side of the centre pier is built a projecting desk—for the reading of the martyrology it is supposed.

At this same time, apparently, the Lavatory was formed off the vestibule, with access through what was probably before a porch door that was reduced, and in the small apartment found a basin-trough was placed, and in the south wall a fireplace formed. Local interest attaches to this little room as having been taken possession of by a poor woman, who here nursed a son, afterwards General Anderson, founder of the Elgin Institution. The sacristy may have been situated in one of the west towers, either on the ground or the upper floor, where there are various apartments. In 1506, as mentioned, the central tower fell; nine years later its re-erection was begun by Bishop Forman and completed in 1538. What the extent was of the piers that this second time were employed to support the tower is not now very easily found; one abutment of the period alone remains at the south-west angle. In any case the piers have been insufficient, for this tower, too, fell in 1711. The view given by Sleszer shows a square tower with single lights in each face; a corner turret rises higher at the north-west angle; at that and the south-west angle are canopied niches containing large statues; doubtless the same occurred at the other angles. Not unreasonably we may connect the three large figures on the ground in nave south aisles with these niches. One is a bishop, and generally identified with Bishop Iones; his tomb, it is recorded, was at the north-west base of the earlier tower, and was most probably destroyed when that tower fell. The second figure is fragmentary—a kneeling ecclesiastic, so it may represent a founder of the new tower, Bishops Forman or James Hepburn. The third figure is a knight in armour. The height of this central tower is given as 198 ft., which must include some steeply or saddle-backed roof. This was the latest addition made to the cathedral.

1568 saw the beginning of many reverses; in that year the roofs were stripped of their lead, the same fate befell Aberdeen, and the cause was the necessity for providing ammunition for the Scottish troops, then in Holland. After the Reformation it would seem that the church was only partially used, though so late as 1594 mass was said within its walls, and even until 1640 its ruins were resorted to by worshippers. The Protestant episcopal party held their services in the church of St. Giles; their first prelate, Bishop Douglas, was buried there: and a tomb erected that subsequently was removed to its present site in the north part of the cathedral grounds. In 1637 the choir rafters were blown down by a high wind; it may be noted that the account of this mishap includes the statement that the roof had been left without slates eighty years before—that is eleven years previous to the last stripping referred to. Whether the roofs of the transepts, nave, and west tower existed even so late as this date is uncertain. Three years later the roof-screen was wilfully destroyed; it is described as of timber, with crucifix excellently painted, having gold stars facing west, and a painted dome facing east. The appearance of the building fifty years later may be judged of from the "Theatrum Scoticæ." In 1711 the tower fell, and either with it brought down the north transept and the nave arcades, or so fractured these parts that their collapse was not long averted. The mass of ruins, however, was not suffered to encumber the ground long, being gladly seized upon by all requiring building material. The Crown authorities were the custodians of the edifice, but they were quite indifferent to its protection, all honours in that direction going to a sexton, one John Shanks, whose memorial is that for many years he devoted himself single-handed to the clearing away of all rubbish, while preserving all of carved and moulded work. After his time the ruins have been and are well cared for by the Commissioners of Woods and Forests.

There are various monuments of interest in the church. The earliest is a wall-tomb on the north side of the choir; the opening is on the ground level, under a cusped arch that is enclosed within a gable. Strangely enough, for whom the tomb was intended is not positively known. Bishops Barr or Spynie are suggested, as both were buried in the choir, though their dates are later than quite suits the tomb. A similar, but plainer, wall-recess is in Kirkwall Cathedral nave. The adjoining canopied tomb, that fills up the arch between choir and north aisle, also wants identification; Bishop Patrick Hepburn, d. 1573,

the last of the Roman Catholic prelates, is suggested. Two tombs in the north transept gable have been demolished; only the effigies remain; these are of Bishop Dunbar and Sir Alexander Dunbar, 1429-97, father of Bishop Gavin Dunbar, of Aberdeen. Of the same period as the tombs destroyed is a projecting table along north and east walls, having a pannelled front. The two tombs in the south transept are those of the brothers Stewart, Bishops James, 1459-61, and David, 1462-76; the east tomb has an almost flat top, the adjoining one an ogival head. Other wall tombs are; of Bishop Winchester, 1437-58, and Sub-Dean Lyell, the first showing traces of decoration on its arch-soffit; and there are two tombs of sarcophagus type, to William de la Hay, d. 1421, and to the first Earl of Huntly, d. 1470; all these four monuments are in the choir south aisle, called St. Mary's. In the Chapter House are one or two seventeenth-century classic monuments that do not call for remark. The sedilia is unfortunately almost obliterated; it is under a window that, in consequence, has its sill raised a couple of feet; it had four bays or canopies, and flat pinnacles at each end. In the choir is set up a fragment of a Celtic cross discovered in 1823 in the town; it is part of the shaft, 2½ ft. wide, and 1 ft. thick. In the nave is a stone coffin built into the south wall, traditionally believed to have contained the body of King Duncan, wounded in battle by Macbeth, before removal to Iona, in 1046. In the choir is a large slab that has been covered with brass in the same way as a similar one in St. Andrews Cathedral; here also the metal is removed; it is generally supposed to mark the grave of Bishop Moray, 1223-42, but it may belong to a later date.

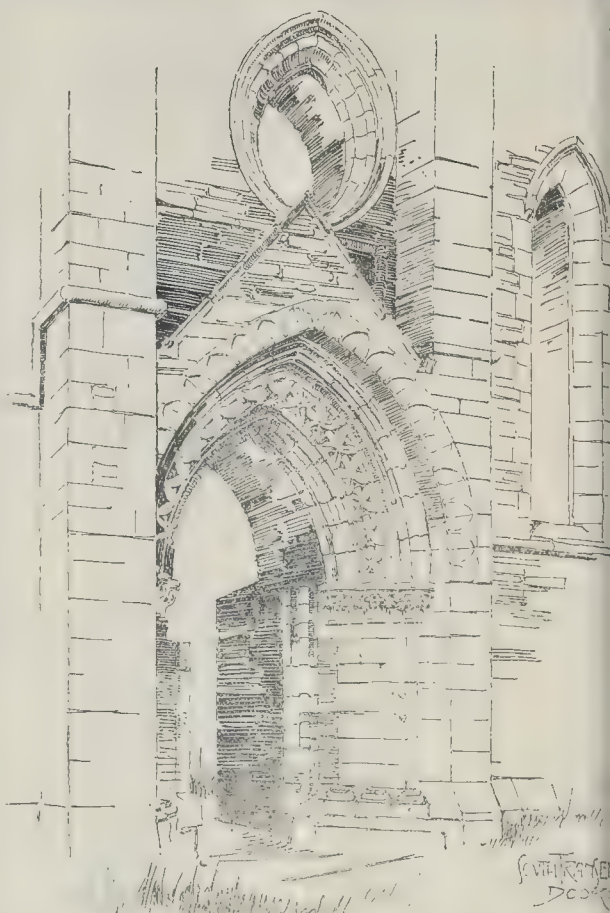
South of the cathedral are the remains of Bishop's cross; the shaft has gone by the time it surmounts three or four steps. North-west of the cathedral is the Bishop's Palace, built by last prelate, Patrick Hepburn: previously residence was at Spynie. The place stands intact, excepting a portion that collapsed years ago; this in spite of provision to establish by iron ties. Only recently it has been mooted to re-erect the fallen parts, and so must be wished the project.

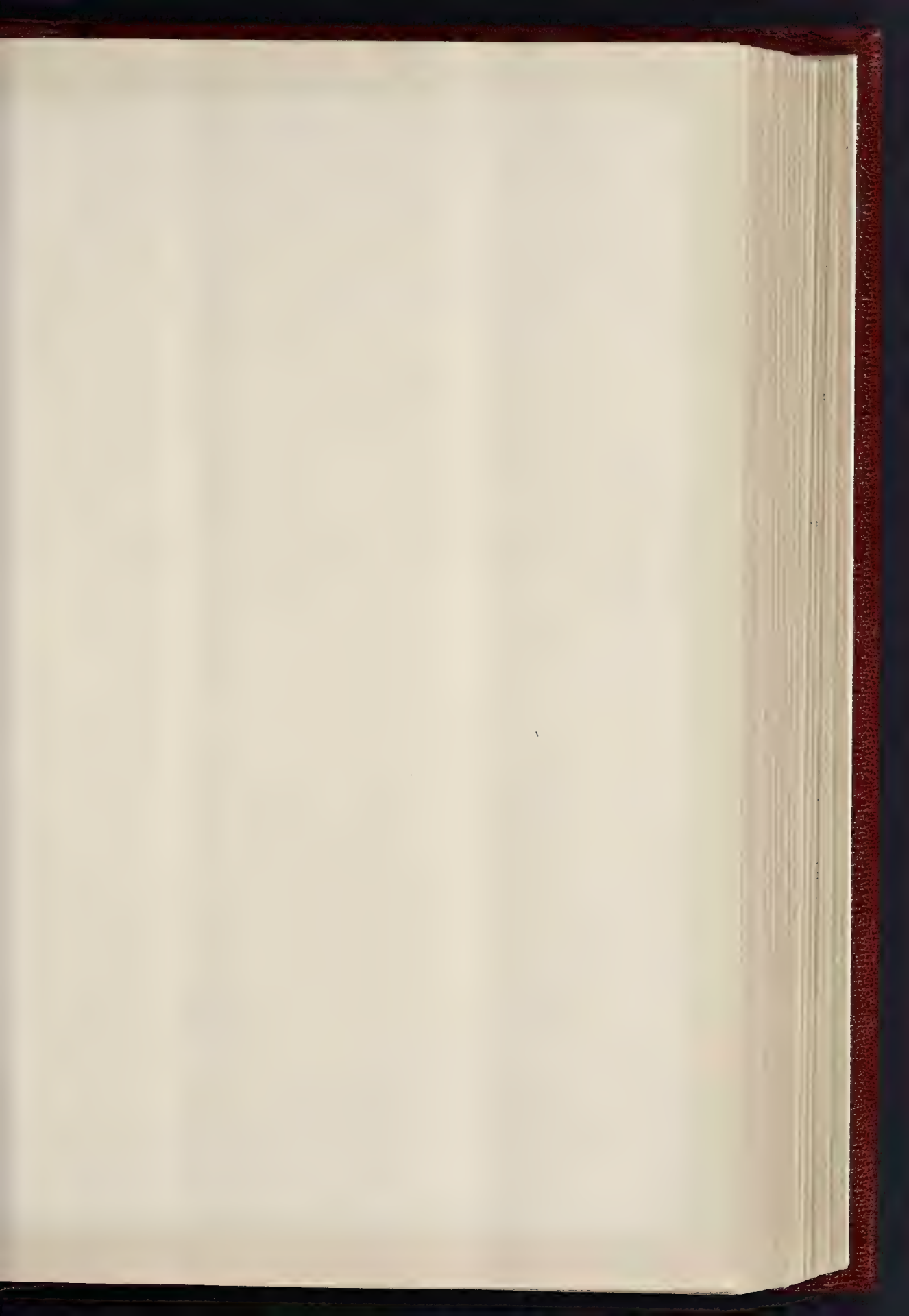
In the Chapter House are preserved all fragments of carved work found. Some of the capitals pier that divided the double aisles are particularly well cut, and have quite the best foliage met with in the building. The capitals about the choir are all moulded, carving being confined to the label stops—all heads—the dog-tooth in many varieties, and in enriched strings. The nave, south aisle, are some excellently carved; at the west door may be compared periods of carving.

Shaw's "History of the Province of Moray" published about the middle of last century amended in a more recent edition, is the authority on the subject.

#### VENDRAMINI PALACE.

This view of one of the finest of the Venetian palaces is published as an illustration to Prof. Aitchison's Fifth Royal Academy Lecture, on another page. Well known as the Vendramini Palace is, we are glad to have an excellent view of it in our pages, where it has not been illustrated, at all events, for many years back.









FARNESE PALACE, ROME.



PITTI PALACE, FLORENCE.



RUCCELLI PALACE, FLORENCE.



CANCELLERIA PALACE, ROME.





belongs to the period of about 1600 or thereabouts, and is a rather curious example of the dying of Gothic feeling (which survived longer in Venice than in Rome and Florence) with Renaissance detail.

#### SOME RENAISSANCE PALACES.

These four well-known Palaces are also given illustrations to Professor Aitchison's lecture, in which they are referred to. The Farnese Palace at Rome was built about 1550 from the designs of San Gallo, the courtyard being having been afterwards somewhat modified by Michelangelo. The Cancelleria Palace at Rome was the work of Bramante; the Rucellai Palace at Florence that of Alberti, about 1460. There is a family likeness between these two in method of using the pilasters, which gives them a certain similarity of character. The Pitti Palace at Florence has been attributed to Michelozzi, and was built somewhere about 1480. It is imposing from its great scale and richness of treatment rather than from any brilliancy of detail.

#### THE LONDON COUNTY COUNCIL.

A usual weekly meeting of the London County Council was held on Tuesday in the County Hall, St. George's Gardens, Mr. John Hutton, the Chairman, presiding.

**Minutes of Heads of Departments.**—The General Purposes Committee reported that they had before them applications from the following heads of departments for a reconsideration of their salaries—viz., Mr. A. R. Binnie, the chief engineer; Mr. T. Blashill, the architect; Mr. A. Blaxland, the solicitor; Mr. W. J. Lin, the chemist; and Mr. Andrew Young, the valuer. In addition to these, the Public Health and Housing Committee had brought before them the question of the salary of Mr. F. F. Murphy, the medical officer of health. The Committee added that they had carefully considered these applications, and they recommended that the salary of Mr. A. R. Binnie, the chief engineer, should be raised from 1,500*l.* to 2,000*l.* a year by two annual increments of 250*l.*; that the salary of Mr. Murphy, the Council's medical officer of health, should be increased from 1,000*l.* to 1,250*l.* a year from April 1. A discussion took place on these recommendations, but it was ultimately agreed, after several amendments had been proposed and lost, to grant the recommended increase of salary to Mr. Binnie. The other recommendation was agreed.

**Policy of the Council as to Water Supply.**—An adjourned report of the Water Committee was then considered. As we gave the substance of the report last week, page 157, we need now only the recommendations of the Committee, which were as follows:—

(a) That negotiations be entered into for the lease of the undertakings of the water companies, or one or more of them, at a fair and reasonable price, on the basis of a desire to purchase and to sell; having regard to any circumstances and statutory provisions affecting the present prospective position, income, expenditure, liabilities, obligations, and value of the companies actively and their undertakings, including any present and probable future demands for improvements and extensions of works, and new or additional sources of supply, and on the understanding that satisfactory terms cannot be mutually agreed, an application will be made to Parliament to mine in what manner and on what conditions a reference to the Council shall be arranged.

That the Water Committee be authorised to negotiate on the above lines, and to prepare details on the basis of arrangements.

Mr. Hopkins, the Chairman of the Committee, submitting the report, said that there was no loss to be made, as their hands had been forced by the result of events. Some of the conclusions of the Water Committee were surprising. The Council had found that, without going outside the Metropolitan area, it was possible to obtain sufficient for the Metropolis in 1931. The water companies had put upon that finding a construction that it would not bear. The Council had reported that as a physical fact quantity of water could be obtained within the Metropolitan area, but it was not to be inferred that they would be justified in taking it. As a result of fact, the Commission had been careful to avoid any assertion on the question of policy. On the issue of the report, they found themselves confronted by three formidable Bills promoted by

three water companies. These Bills professed to be backed by the report of the Commission. The companies asked for powers that would greatly augment their vested capital. Two of the companies asked for powers to construct works of huge magnitude and great permanence, while the Southwark and Vauxhall Company had had the boldness to ask, in the name of the united companies, for power to take from the Thames the whole of the water running down to Teddington, with the exception of 200,000,000 gals. a day. He did not believe that Parliament would grant anything like such powers, which would be disastrous to the hopes of the people of London. Immediate action was necessary, because those Bills would soon be before Parliament. If the Council could show that they were willing and able to undertake, on fair and just terms, and to carry on the water supply of the Metropolis, all pretext for addition to the vested interests of the companies would be removed. It was contemplated by the Royal Commission that there should be taken from the Thames 300,000,000 gallons, from the Lea 52,500,000, and from springs and wells 67,500,000 gallons, making an additional volume of 420,000,000 gallons per day. He would not criticise those figures, though it was believed in influential quarters that their adoption would be attended with extreme peril to London. The scheme depended upon nine large reservoirs being made in the neighbourhood of Staines, and he would only say that the practicability of making those reservoirs was seriously doubted by eminent engineering and geological authorities. One aspect of the question—namely, the financial aspect, had not been dealt with by the Commission. The general estimate of the companies was 9,702,675*l.*, which, with inevitable extras, would come out at about 10,000,000*l.* Mr. Binnie, whose authority as a water engineer was second to none, was distinctly of opinion that the cost of those reservoirs would not be much less than double the sum mentioned by the promoters. The scheme contemplated the employment of a thorough system for the prevention of pollution, and that would require the employment of an army of inspectors. He urged the Council to adopt the recommendations of the Committee, embodying as they did the first of a series of steps which it was of great importance that the Council should take.

Mr. Saunders, M.P., moved that the following words be added to the recommendation (a):—"Provided that no monopoly right on the part of the water companies be recognised." If, he said, the water companies possessed a monopoly right they could only be bought out at enormous cost. Of course they had no such monopoly right, and it was merely to guard against any misconception on that point that he moved the addition of those words.

Mr. Harvey seconded the amendment, which was accepted by the Chairman of the Committee. Colonel Rotten asked whether the Council had any legal right to compete with the water companies.

Mr. Hopkins said there was nothing whatever in the law to prevent the Council establishing a competing supply.

Lord Farrer said he was not going to oppose the report, though he doubted whether the present was a favourable time for negotiating with the companies, which were just now elated on account of the finding of the Royal Commission. Until the Commissioners' report was pulled to pieces by criticism, he did not think the public would be quite aware of what it meant. On the other hand he recognised that there were reasons for approaching the companies with terms of purchase, which would place the Council in a better position to oppose their scheme. He suspected that the negotiations would be useless. He desired to indicate certain precautions which he thought the Council should take. It was desirable for it to enter the contest with as many allies as possible. On a former occasion they were in alliance with the Corporation of the City of London, but perhaps it would not be so easy to secure the co-operation of the City after the publication of the report of the Special Committee on London government. West Ham and the other districts outside the county had shown themselves to be very interested in the question, and he thought it would be well also to secure them as allies. Then there was the question of the Council's relation with the Thames Valley districts. The suggested scheme, which involved the employment of an army of inspectors, would mean that every house and garden on the banks of the river would be liable to invasion and inspection at any moment, and that would bring the

occupiers up in arms and in open rebellion. The engineer said it would be necessary that there should be no cesspool within four hundred yards of the Thames and its tributaries, and were such a rule to be enforced the valleys would be depopulated. He hoped the Council would try and act in concert with the County Councils on the banks of the Thames. It was important to go into Parliament well armed and equipped for what he was sure would prove a very long and difficult fight.

Mr. Lloyd thought Parliament should be called upon to say that any expenditure the companies might be put to for future extensions should be met by the Council, which would then become the owner of the new works.

Dr. Collins deplored the short limit of time taken by the Commission as the basis for estimating the future needs of the metropolis. The real question, he thought, was whether London should continue to drink purified sewage or whether it should seek an adequate supply from some distant watershed, which would be secure from contamination. The Commission had not taken into account many significant facts, and, among others, that the outbreak of cholera in 1866 was traced to the water supplied in East London. It was not difficult to take the view that the report of the Commission was a prearranging one, leading to no satisfactory conclusions.

Sir John Lubbock said there seemed to be a general consensus of opinion on the part of the Councillors who had spoken that a new source of supply ought to be secured. He thought the Council had quite as much work already as it could satisfactorily get through, and that it was undesirable for it to assume a new responsibility and burden by taking over the water companies. It was said that the result would be a saving in the rates. He believed, on the contrary, that it would involve an addition to the rates. The Council ought not to break its own back, and he thought that in negotiating with the companies it would be making a mistake.

The recommendations of the Committee, as amended, were agreed to.

Lord Monkswell moved as an additional recommendation:—

"That, while carrying on the negotiations above referred to, the Committee be instructed to communicate with the various authorities affected or interested, to ascertain their views on the subject generally."

This was seconded by Mr. Torrance, and also agreed to.

**New Buildings.**—The report of the Theatres and Music Halls Committee contained the following paragraph:—

"We occasionally find that after drawings for a new place of public entertainment have been approved by the Council, no further steps are apparently taken by the applicant, and the premises are not erected. This we think is undesirable, as the Council is not perhaps cognizant of the position of affairs until a further application is made and drawings are submitted in connexion with another scheme for building on the site. We therefore recommend:—

"That in future when drawings with respect to new places to be used for public entertainment are approved by the Council, it be upon condition that the works in connexion therewith be commenced within six months from the date of the approval of such drawings by the Council."

The recommendation was agreed to.

After transacting other business the Council adjourned at half-past seven o'clock.

**PROPOSED LOCAL MUSEUM AT EPPING FOREST.**—On the 24th ult. a meeting, convened by the Essex Field Club in furtherance of the proposed Epping Forest Free Local Museum, was held in the banqueting-room, Queen Elizabeth Lodge, Chingford. Professor Meldola explained the aims and objects of the scheme, which were that a free local museum to illustrate the natural history, history, archaeology, &c., of the district would be a suitable addition to the many attractions the neighbourhood of Epping Forest now possessed. The Queen Elizabeth's Lodge at Chingford, having been carefully preserved by the Conservators under the Act of Parliament as an object of antiquarian interest, was admirably fitted for the purposes of a local collection of the kind proposed. The Council of the Essex Field Club would be willing to undertake the gathering together of specimens, and the curatorship and scientific superintendence of collections as a branch of the central museum. Before any steps for the actual formation of the museum can be taken the sanction and co-operation of the Epping Forest Committee will be necessary. It is estimated that 300*l.* would be required for the necessary museum appliances, but a sum of from 150*l.* to 200*l.* would justify them making a start. A resolution in favour of the scheme was carried, and a subscription-list opened.



## BUILDERS' CLERKS' BENEVOLENT INSTITUTION:

## ANNUAL GENERAL MEETING.

THE twenty-seventh annual general meeting of the donors and subscribers of this Institution was held on the 27th ult. at the offices of the Institution, 21, New Bridge-street, E.C.4. Mr. William Shepherd in the chair, supported by Mr. E. Brooks (Treasurer), and by Messrs. E. C. Roe, W. Seymour, J. A. Robson, C. K. Turpin, F. S. Oldham, H. W. Parker, A. Stansfeld, H. T. Desch, O. Newling, W. D. Gilbert, and other gentlemen.

The report stated that the income for the past year had amounted to £674 16s. 9d., of which sum £257 4s. 6d. consisted of annual subscriptions, £299 0s. 0d. in donations, £116 17s. 4d. in dividends, and £1 14s. 11d. interest on deposit account. The total expenditure was £458 13s. 6d., of which 335s. was paid for pensions, and 257s. in various grants for temporary relief. Two elections were held during the year, Mrs. Martha Marcham being elected at the first and Mrs. Louisa Clark at the second. Two pensioners had died during the year, viz., Mrs. S. A. Coulson and Mrs. L. R. Styles. The number of pensioners now on the books is 17; the total number elected since the foundation being 37. Referring to the Orphan Fund, the committee reported that the Institution had now two vacant presentations to the Orphan Working School, and the committee were prepared to receive applications on behalf of builders' clerks' orphans, whose friends may wish to nominate them for election. The fifteenth annual dinner was held on the 18th of April last at the Cannon-street Hotel, Mr. W. A. Colls occupying the chair. The result was highly gratifying alike to him and to the committee, the sum of 320s. having been announced in aid of the funds. The committee had the painful duty of recording the death of the President (Mr. W. A. Colls) which occurred in October last, and which was the first instance, since the Institution was established, of its loss of a President by death during his year of office. By the untimely death of this gentleman the committee feel that they have lost a personal friend, and the Institution one who took an earnest interest in its welfare. Mr. Colin G. Patrick kindly completed the year of office broken by Mr. Colls' death. Mr. William Shepherd had favoured the committee by consenting to act as President for the present year. The committee announced a further purchase of stock, bringing up the total of invested funds to 4,550s. The report concluded by thanking the donors and subscribers for the assistance rendered.

The President Elect (Mr. Wm. Shepherd), in moving the adoption of the Report, said that it seemed to him that the Institution was deserving of support; those who composed it, in looking to the future, could not be expected by reason of their position to seek help of a legislative character which, perhaps, would not be thought at all derogatory in some other cases. It certainly seemed to him that it was a duty to make, in some way, provision in the event of need arising, and that it was, therefore, the duty of everyone of them as far as possible to help in maintaining such an institution as this—a duty to assist in the matter, and band together for mutual benefit. The number of builders' clerks at present supporting it was not so great as he should like to see. The Institution was a good one, and he could not see why more clerks did not belong to it. Mr. Shepherd concluded by moving "That the report, &c., be adopted and circulated amongst the subscribers."

Mr. W. D. Gilbert seconded the motion, which was put and carried unanimously.

A resolution was then proposed by Mr. E. Brooks and seconded by Mr. C. K. Turpin, thanking Mr. Colin G. Patrick (who had kindly completed the year of office unhappily broken by Mr. W. Colls' death) and the other retiring officers for their past services, which was also unanimously adopted.

On the motion of Mr. E. C. Roe, seconded by Mr. F. L. Oldham, the following gentlemen were elected officers for the ensuing year: viz., Mr. Wm. Shepherd, as President; Mr. John Burton, as Vice-President; Messrs. S. J. Thacker, T. Stirling, and Ernest S. Rider, as auditors. While a number of gentlemen whose term of office had expired by rotation were again elected as members of committee, and in addition Mr. H. T. Desch (Messrs. Cubitt & Co.) and Mr. O. Newling (Messrs. Colls & Sons) were elected members for the first time.

## ARCHITECTURAL SOCIETIES.

CARDIFF ARCHITECTS' SOCIETY.—At the Lecture-hall of the South Wales Institute of Engineers, Cardiff, on the 21st ult., Mr. Edwin Seward, F.R.I.B.A., delivered a Presidential address to the members of the Cardiff Architects' Society. Mr. Seward dwelt upon the architectural growth of the principal European cities, and gave an outline of what the future of Cardiff should be. After alluding to the fact that members of provincial centres might now share with Fellows and Associates many of the advantages of the Royal Institute of British Architects, Mr. Seward stated that, under the new alliance the younger members and students from South Wales could sit for their periodical examinations in connexion with the Cardiff Centre. Proceeding, Mr. Seward said:—These benefits have for some years been shared in larger towns, as Manchester, Liverpool, Sheffield, &c., but in Cardiff they may be said to still lie before us. If Cardiff will show as much activity and enterprise in the art of true architecture as in the art of building, it may well be hoped that in a few years we may feel there has been but little lost time, and our town may yet compare with, at any rate, commercial cities like some of those I have named. . . . When I was asked to deliver a first Presidential address to this Society, I thought at once of some of the grand works of the old architects which it is a true delight to think and talk about. But we live in too progressive an age to linger overmuch on the past, and, again, we must not act so entirely in the living present that we have not leisure to attempt a discerning of the future. It seemed evident, therefore, that the subject matter of this address should be one that will allow us to glance back, to look around, and to gaze forward. In doing this, I want, if possible, to adorn my tale with art pictures of beauty from far and near, and to point my moral here in Cardiff—in Cardiff as it was and as it, perhaps, might be. I also desire to make suggestions illustrating the desirability of entering upon the consideration of a comprehensive scheme which may of itself open up, not one site for public buildings, municipal and otherwise, but, more probably, one dozen such sites. To my brother architects I would say that few objects could be found more likely to conduce to the honour and benefit of our profession than this, and few subjects could be more attractive to us as loyal townsmen. Mr. Seward proceeded to explain a large number of views of fortified and other towns and buildings in the different countries of Europe, demonstrating the architectural magnificence of the past two or three centuries, and said that municipal authorities in the Middle Ages, although, perhaps, not educated, had a high appreciation of the beautiful in architecture. Mr. Seward also urged the desirability of paying due regard to the question of open spaces in our principal towns. He also unfolded a scheme embodying the considerable re-moulding of the town of Cardiff upon lines already suggested, to some extent, by the municipal authorities. The meeting closed with a cordial vote of thanks to the President for his address.

GLASGOW ARCHITECTURAL ASSOCIATION.—On the 17th ult. a lecture was delivered in the rooms, 114, West Campbell-street, by Mr. George Walton, the subject being "Interior Decoration." In the course of his address the lecturer urged that simplicity and not elaboration should govern the work, and ornament, if used at all, should be used sparingly, and should be very fine and well adapted for its position. Pictures have their decorative value, and this has perhaps been overlooked by the artists of to-day, who, in the opinion of the lecturer, might act a little more in unison with the architect in creating work for permanent positions. In the decoration of an ordinary commonplace house, the aim should be to get rid of the ugly portions, having them replaced by suitable decorations of an artistic value. The treatment of ceilings, walls, and floors was dealt with at length by the lecturer, who described various methods of producing good results by the harmonious employment of the materials.

A PARISH CHURCH LIGHTED BY ELECTRICITY.—The Parish Church of Leamington has been lighted by electricity. From the central dome depends a 24-light chandelier, and an ornamental 10-light pendant is fixed to the roof of the sanctuary. The nave, transept, side aisles, and choir-stalls are lighted by incandescent lamps attached to brackets on the caps of the pillars. Altogether there are 188 lights, 120 being of 16-candle power each, and the remainder 25-candle power each. The current will be supplied by the Midland Electric Supply Company.

## ARCHÆOLOGICAL SOCIETIES.

BRITISH ARCHÆOLOGICAL ASSOCIATION.—The 21st ult., at a meeting of the British Archaeological Association, Mr. Allan Wyon in the chair, the Rev. H. T. Owen gave a description of excavations which he has had effected at Vercrucis Abbey, Llangollen. The entire ground plan of the Cloister Court has been laid open observation, the remains being extensive. Mr. Frank Williams reported the uncovering of a length of the Roman Wall of Chester, at Roodeys, during some building operations. He also some discoveries in Watergate-street, 81, Matthews Jones, City Surveyor of Chester, particulars of some other discoveries in Watergate-street, where a portion of a Roman villa has been found, and carefully preserved for inspection. Mr. Oliver sent a rubbing from a brass at Llyn in which the old custom of "Riding the Stan" is represented beneath the effigy of the deceased, who is commemorated on the brass. Mr. Boddy exhibited a fine collection of Roman coins found near Castor, Northants, some having Christian inscriptions. Mr. Loftus Brock described some Roman coins found at Springhead, Gravesend, on which Christian emblems were represented. They were of emperors later than the time of Constantine. He exhibited also a coin of Crispian. On the reverse, the emperor held a standard in each hand, both standards having a monogram of Christ. The Chairman exhibited a silver Communion cup, belonging to St. Swithun Church, Cornwall. There are no hall-marks but it is dated 1576. He exhibited also some designs of seals of the County of Glamorgan from deeds preserved at Margam Abbey.

## INSTITUTION OF CIVIL ENGINEERS.

AT the ordinary meeting of this Institution on the 27th inst., Mr. Alfred Giles, President, in the chair, two papers were read relating respectively to construction and the electrical equipment of the Liverpool Overhead Railway. The first paper was entitled "The Liverpool Overhead Railway," by Messrs. J. H. Greathouse and F. Fox, M.M. Inst. C.E., and began with a history of the undertaking. Mr. A. G. Lyster, who had minutely studied the New York system and reported thereon to the Liverpool Corporation, had expressed himself in favour of an overhead electrical railway, and some delay an Act was obtained in 1882 by the Mersey Dock Board for the construction of a double line of 4 ft. 8½ in. gauge. The estimate for this, fully equipped and worked by electricity was 466,000s. The structure was intended to consist of plate girders, with overhanging continuous footways having parapets of iron lattice-work, with the rails laid upon greenheart plating; the whole being supported by columns: partial lattice-work placed in the normal structure on each side of the lines of dock-railway. Owing to the fact that many influential members of the Dock Board were unwilling to embark upon railway management, the undertaking was in 1887 leased to the present Liverpool Overhead Railway Company, by which the line was constructed. The length of railway at present constructed was 5 miles, but would ultimately be 6½ miles. In the structure decided upon, the columns were placed vertically under the ends of the main girders, about 22 ft. apart from centre to centre, allowing sufficient width for two lines of standard gauge with the usual 6-ft. 6 in. way, and admitting the use of carriages 8 ft. 6 in. wide. Local circumstances in many cases did not, however, admit of the columns being placed immediately upon the main girders, and the latter were then carried upon cross-girders outside the line of columns. For considerable lengths also the columns had to be embedded in the boundary and warehouse walls. Owing to the presence of the usual way, cross-bracing of the piers in the dock lines below, cross-bracing was necessary to give to the columns and to the shallow cross-bracing connecting them at the top sufficient strength and rigidity to resist the late stresses due to wind-pressure, and, on curves, the centrifugal force resulting from the motion of the trains. In carrying out the works no special difficulties arose in connexion with the foundation of the piers. In places where rock was not reached, masses of concrete were deposited to sufficient extent to insure the maximum load. The base not exceeding one ton per square foot. In excavating for the foundations the sill of the first dock made in Liverpool was discovered, at several lengths of old water-pipes, consisting of trunks of trees bored out and fitted together, were brought to light. Owing to the railway being placed immediately over the dock lines, it



er were in many cases diverted, straightened, improved. The columns supporting the duct consisted of two steel channel bars to two steel plates, forming a box with all the rivet-heads outside. These columns were grouted into cast-iron sockets and in bolted through the blocks of concrete. Cast-iron bumpers filled with cement-crete protected the columns from injury from passing wagons. The normal span was 50 ft., longer spans up to 98 ft. and shorter ones not up to 30 ft. were required in some cases. Up to 15 ft. span, the height of the girders above the level did not exceed the platform height, and te-girders were used. In longer spans bowing girders were used. Between the girders a fixed Hobson's arch-plate flooring, consisting of  $\frac{1}{4}$  in. plates bent to a radius of 12 in., on a flat surface 6 in. wide on the top, riveted intervening T-bars, and made water-tight by built in the V-channels between the arches. The structure was so designed that the spans could be put together and riveted up with floor complete at one or both ends of the railway, and then transported over the completed portion of the structure to be placed in position. Special form of erecting-machine was provided, consisting of two lattice-girders standing upon rests on the ground at the front end, and the hinder end upon a carriage running on rails on the viaduct. These girders were placed such an altitude as to allow the trolley carrying succeeding span to be rolled along underneath them. On these lattice-girders were placed travelling cranes, so arranged as to lay hold of the spans on arrival, run them forward, and hoist them in their permanent position upon the columns which had been erected in advance. The average time occupied by this operation was one hour per span. In the course of the work several opening bridges had to be provided which are described and illustrated in the paper, and also the stations, permanent way, and siding-stock. The total quantity of iron and steel the structure was about 22,000 tons. The total cost, including equipment and all other charges, had been £550,000, or about £90,000 a mile of railway. The line was formally opened by the Marquis of Salisbury on February 1893, and was opened for traffic on March 6 following. The electrical system of working was completely successful, a five-minute service of its being maintained with perfect regularity without mishap of any kind. The second paper was entitled "The Electrical Equipment of the Liverpool Overhead Railway," by Mr. T. Parker, M.Inst.C.E.

Edinburgh Architectural Association, and with a request to examine the document and report to the Council of the Association thereon.

This they have done, and I am desired, in the name of the Council, who have carefully considered the report, to draw attention to three points in these conditions, which, in their opinion, are highly objectionable, and which they trust the Provost, Magistrate, and Town Council may see their way to amend.

These points are—  
1. The amount of commission offered.  
2. The power reserved to retain the three sets of designs for which premiums are offered, without employing the author of the first premiated set to carry out the work.  
3. The absence of any provision for the engagement of a professional assessor.

As regards the—  
1st. The amount of commission offered being 4 per cent. is one-fifth less than the commission recognised by the Royal Institution of British Architects and the other Architectural Associations in the United Kingdom, and the result will be that architects of standing, who conform to the rules of the profession, will be deterred from competing.  
2nd. The absence of guarantee that the architect of the first premiated set of designs will be employed in the erection of the buildings is quite sufficient to prevent any competent practising architect from competing, as there is no inducement to him to spend time in preparing designs which may cost him the amount of the premium to prepare possibly more—and so leave him without any legitimate reward for his labour.

The 2nd and 3rd sets should be returned to their authors, as no architect with any respect for himself would appropriate the work of another competitor. Presumably the premiums are offered as some compensation for the trouble the unsuccessful competitors have been put to, and not as representing the value of the designs. This being so there can be no objections to the said drawings being returned to the authors.

3. The absence of any provision for the engagement of a professional assessor will inevitably prevent many architects from submitting designs, as it is quite evident that however able and well-intentioned a lay committee of judges may be, there are many points, both technical and artistic, which can only be fully appreciated by an architect, who has made the study of planning and designing the business of his life.

It is observed that the total cost, including three halls, library, subsidiary buildings, boundary walls, architect's and measurer's fees, and clerk of works' salary is not to exceed the sum of twelve thousand pounds sterling (£12,000). The Council of the Association had not an opportunity of examining the extent and situation of the proposed site, but it occurs to them that the sum of £12,000 will prove very insufficient for all that is stipulated for, especially as the buildings are to be of a monumental character. They have thought it right, therefore, to refer to this, so that your committee may not afterwards be disappointed.—I am, Sir, your obedient servant,  
WILLIAM ROY SPEARS, Esq., (Signed) T. FAIRBAIRN,  
Town Clerk, Kirkcaldy. Hon. Sec.

COPY, LETTER, HON. SEC., E.A.A., TO TOWN CLERK, KIRKCALDY.  
W. ROY SPEARS, Esq., 56, Queen-street, Edinburgh, Town Clerk, Kirkcaldy. February 9, 1894.  
Beveridge Hall, &c., Competition.

DEAR SIR,—I am directed to remind you that I have not been favoured with a reply to my letter of December 23 last regarding the above.—Yours faithfully,  
(Signed) T. FAIRBAIRN, Hon. Sec.

COPY, LETTER, TOWN CLERK, KIRKCALDY, TO HON. SEC., E.A.A.  
T. FAIRBAIRN, Esq., Hon. Sec. Edinburgh Architectural Association, Town Clerk's Office, Kirkcaldy, 56, Queen-street, Edinburgh. February 10, 1894.

DEAR SIR,—I have yours of yesterday, and also received yours of December 23. The Council have decided to adhere to the conditions of the competition. An Architectural Adviser, however, will be appointed.—I am, Dear Sir, Yours truly,  
(Signed) W. R. SPEARS, Town Clerk.

#### ORIENTATION IN ARCHITECTURE.

SIR,—In connexion with your leading article in your issue of February 17, will you allow me to add some further remarks to my letter of December 16? The investigation of the general question of the relations between architectural structures and the celestial bodies is evidently in the way of being considerably advanced in the course of the next few years. Obscure though the subject is, it is important and attractive by its very obscurity. Its importance appears to me to lie in the fact that the question has manifold bearings—it touches, perhaps, primarily, religion and related fields of psychology; it touches architecture and archaeology; it touches astronomy and it touches chronology. In short, it promises to make no inconsiderable accession to our general knowledge of human progress.

But there is evidently a vast amount of work to be done in the way of actual observation and measurement, and in the critical discussion of conclusions, in order to determine what orientation will and what it will not explain, and to distinguish between intentional and conscious orientations of the builders themselves and orientations which perhaps only modern theorists have discovered. When this knowledge has been gained we shall have materially widened our views upon the significance of ancient monuments, the mental attitude of their builders, and the meaning of more than one point of modern ceremonial observance.

As yet the subject is all involved in obscurity, our ignorance is much greater than our knowledge. We have not, as I said, yet ascertained how much the

ancients themselves intended and knew as to the orientation of their own constructions. To be candid, we ought to confess this frankly and keep it always in mind. We ought also to endeavour never to lose the guidance of common sense, nor, as your leading article warns us, allow ourselves to view a broad question only through our own particular spectacles.

I write this for no more special purpose than to help to draw the attention of your readers to the subject. That my former letter, with the exception of the kind explanations from Mr. Penrose, has led to no further correspondence is very possibly owing to the novelty and obscurity of the subject. I should like to take the opportunity of calling attention to the articles by M. H. Nissen, of Bonn, in the *Rheinisches Museum für Philologie*, to which Mr. Penrose alludes in his own Royal Society paper. M. Nissen's articles are a long series, and apparently not yet concluded. He handles his subject in thorough German fashion—that is, the papers are neither short nor superficial. At the same time they are not over-cloaked with mysticism. The author deals first with the churches and temples at Rome, then with the Egyptian and Greek temples. Though he approaches the last-mentioned from a different point of view, he comes to one general conclusion at variance with Mr. Penrose's position; he says, with regard to their possible orientation, that so far as his examination of the material goes, there can be no question of alignment towards stars during the earlier periods, though it may be proved, to a limited extent, for Hellenistic and Roman times. M. Nissen, therefore, contents himself with an attempt to derive the month-dates of the festivals. Mr. Penrose's attempt at a combined stellar and solar orientation is much more hazardous, and I must think it more interesting and suggestive than convincing or conclusive. I am still unable to assent to his general principle that the temples were directed to stars in order that the priests might know the time by them.

I am bound to say this appears to me far too trivial and practical a purpose to have controlled the laying-out of a sacred edifice. If we can accept this, we could equally accept Mr. Lockyer's position that the Egyptian Temples were primarily "star-pointers," the archetype of the modern astronomical observatory.

It would be safest to proceed simply from such broad underlying principles as that the heavenly bodies were for the ancients visible manifestations of divinities; that as temples were built as their abodes upon earth it was but natural to bring such buildings into relation with their abodes in the heavens, with the visible manifestations of their presence there; that if the purpose of the orientation was not actually liturgical, it was at least symbolical. The orientation of a Christian church is now, I suppose, merely traditional, a pure survival; possibly the orientation of an ancient temple was already little other than symbolical, seeing that the practice prevailed at the vastly more remote period of the great stone monuments.

I should have liked to refer to the difficulties of obtaining accurate measurements of orientations, but this letter is already over-long. I will conclude by quoting a couple of instances of indicated orientation from the Old Testament, which may have escaped notice. One is an allusion in the book of Job (xxviii., 4, 5) to the Egyptian foundation ceremony of "stretching the cord"; "Where wast thou when I laid the foundations of the earth? . . . who hath stretched the line upon it?" The other is in the description of the Tabernacle in the wilderness in Exodus xxvii., where the construction of the north, south, and west sides of the court are described, while the east is left for the entrance.

ENQUIRER

#### SURREY COUNTY COUNCIL SURVEYORSHIP.

SIR,—I read with interest your "Note" in this week's *Builder* re above matter. You only mention Mr. Bidder as having protested against the manner in which the whole matter was carried through.

I wish particularly to have it stated that I seconded his motion, and that his only other supporter was Mr. Roberts, of Richmond. I wish this, as I should be exceedingly annoyed were any one who knows me to suppose that I had allowed such gross neglect of the public interest to pass unnoticed. As a matter of fact, I was the first to call public attention to the matter on the Council at the November meeting, being supported on that occasion only by Mr. Roberts.

May I also say that while fully endorsing your remarks as to the impropriety under the circumstances of the chairman's giving his casting vote, I cannot but think that the point which I have all along commented upon is of even more importance—namely, the conduct of the special committee in placing Mr. Howell's name in the list of four candidates which they submitted for the final decision of the Council.\*

This committee had before them testimonials from

\* We had already commented strongly on this point, to the same purport as our correspondent, in a "Note" published at the time of the election of the Surveyor.—E.T.

#### Correspondence.

To the Editor of THE BUILDER.

#### BEVERIDGE HALL COMPETITION, KIRKCALDY.

SIR,—I am instructed by the Professional advice Committee to enclose copy of correspondence which has passed between the Association and the Town Clerk of Kirkcaldy. It may interest your readers to know that so far back as December 23 last it was pointed out that the conditions were such as would prevent representative architects from taking part in the competition.—Yours truly,  
T. FAIRBAIRN, Hon. Sec.

Edinburgh Architectural Association, 56, Queen-street, Edinburgh, February 22, 1894.

CORRESPONDENCE BETWEEN THE TOWN CLERK OF KIRKCALDY AND HON. SECRETARY OF THE EDINBURGH ARCHITECTURAL ASSOCIATION.

HON. SECRETARY OF THE E.A.A. TO THE TOWN CLERK OF KIRKCALDY.  
ROY SPEARS, Esq., 56, Queen-street, Edinburgh, Town Clerk, Kirkcaldy. December 23, 1893.

SIR,—As instructed by the Council of the Edinburgh Architectural Association, I beg to enclose Representation in them with regard to proposed Beveridge Hall, &c., Competition, and to request that you will be good enough to submit it to the Committee as early as convenient.—Yours obedient servant,  
(Signed) T. FAIRBAIRN, Hon. Sec.

COPY REPRESENTATION REFERRED TO.

The Royal Institution, Princes-street, Edinburgh, December 23, 1893.

SIR,—A copy of the conditions laid down by the Provost, Magistrate, and Town Council of Kirkcaldy for the erection of architects who may feel disposed to compete for the erection of the Beveridge Public Hall, Free Library, and Adam Smith Memorial Hall has been laid before the Professional Practice Committee of the



104 candidates, including most of the best men in England; on what principle could they pretend that Mr. Howell had any claim to be among the first four—or, indeed, the first forty? If he had been so brilliant in ability as to be justly entitled to preference to 100 other gentlemen, would he have remained all these years without having held some public appointment? As it was, men who had every qualification for the post, and who had held valuable and responsible public appointments, were passed over in his favour. Hoping you will kindly give me space to show that I disapproved most strongly of the proceedings of the Council, I will conclude by saying that I consider you have rendered a public service by your comments on the matter, and I feel bound to say that this election has, in my opinion, lowered the reputation of the Council in the eyes of the public, and that the whole affair is most unsavoury and discreditable.

OCTAVIUS HOLMES BEATTY,  
Councillor for South Wimbledon Division.

#### NORTH WALES ASYLUM COM- PETITION.

SIR.—Allow me to correct a statement that appeared in your last number in reference to the North Wales Asylum Competition. It was I who selected No. 10 for adoption, and the committee loyally endorsed my choice. According to the terms of the competition the committee reserved to itself the power to select any of the four placed by me.  
ED. SALOMONS, F.R.I.B.A.

#### "BLIND-STORY."

SIR.—In your account of the Scottish Cathedral of Dunkeld, I fail to notice any mention of the fact that the "Fasti" of that church, as given by Abbot Mylne, preserve one of the very rare instances, if not the sole example, of the use of the term "blind-story"; for what, by a limitation of a term originally of much wider reference, is now universally known as the "triforium." More than half-a-century ago I lighted on the passage, and sent it to my valued friend, Mr. J. H. Parker. By him it was inserted in the next edition of his "Glossary of Architecture," and thus the term "blind-story" became known. It was adopted by the late Mr. Edmund Sharpe, and employed by him extensively in his architectural publications. But it has never, I think, taken hold of the popular mind, and it is now, I think, seldom met with. The appropriateness of the term "blind-story," however, as opposed to "clearstory"—the range of windows which you cannot see through and those you can—is so evident that one may regret that it ever dropped out of use, and that it has not been more extensively revived.

The passage occurs in Mylne's "Life of Bishop Carden," by whom the existing nave of Dunkeld Cathedral was begun, and carried up to the clear-story string. It is as follows (p. 16):—"Fundavit navem ecclesie suae Dunkeldensis die XXVII. Aprilis, A.D. MCCCCLXVI., et construxit usque secundum arcum vulgariter 'le blind storyj'."

May I add that I was rather surprised to find that attention was not drawn in your article to the very singular and probably unique character of this triforium or "blind-story" range. As will be seen from the illustrations there given, it consists of a series of semi-circular arches, rising at once from the horizontal string-course above the nave arcade, without any shafts—for which, indeed, there is no room—just the arched heads of an ordinary triforium range cut short. Each arch is subdivided by two half arches rising from the centre of the base line, forming, with the intercepted portion of the circumscribing semi-circle, two pointed arches. The spandrel formed between them above is trefoiled. The arches themselves are plain. The effect of this long row of semi-circular openings cannot be said to be pleasing. Can any of your readers mention a similar example? And can anyone supply another instance of the Medieval use of the term "blind-stories?" From the word "vulgariter" employed by Mylne it would seem to have been in common use in the architectural nomenclature of the Middle Ages.

EDMUND VENABLES.

The Precentor, Lincoln, February 26.

#### HEREFORD CATHEDRAL.

SIR.—Having lately visited Hereford Cathedral, will you permit me to make a public protest against the misuse of a portion of the cloisters as a coal store.

When one sees that a few years ago thousands of pounds were expended under the direction of a popular architect of that day in the erection of mere internal decorative (and tawdry-looking) ironwork screens and candelabra, surely the cathedral authorities might devote a few pounds now out of their funds to the structural preservation of these cloisters by the erection of a harmless necessary coal storehouse.

It does seem so sad, so "Philistine" in the worst sense of that word, that these cloisters, intended by those who built them for the meditations and peaceful sanctuary, in troubled and ignorant times, of pious

and learned men, should be thus desecrated by us, their descendants, who, at the end of the nineteenth century, claim to be the heirs of all the learning of all the past ages.

And it is such a mockery to see a begrimed and sooty tombstone or wall tablet stating that it is "Sacred to the Memory" of those who rest below; these monuments having been placed there in the mistaken confidence of those who mourned for the departed that within these sacred precincts they would for ever rest in peace.

February 26, 1894.

PERCY HUNTER.

### The Student's Column.

#### THE STRUCTURE AND PHYSICAL PROPERTIES OF BUILDING STONES.—IX.

##### SIRIURE GENERAL CONSIDERATIONS.

**T**HE structure of building stones may be treated from three standpoints.—(1) Their appearance to the naked eye when seen at the distance of a few feet; (2) their general characters when viewed with a pocket lens; and (3) their structure under the microscope.

An examination by the first-mentioned method frequently reveals important facts unobtainable by either of the others. A fine-grained stone presenting surface characters which would cause it to be passed as an excellent material as judged from inspection of hand specimens, or samples only, frequently on examination of the stone in bulk leads to the conclusion that it is comparatively worthless—or, at any rate, only of inferior quality. It may be that on the large scale it develops "clay pellets," or soft places, which weather out, forming holes, almost immediately after the building is erected. Or, on the other hand, hard concretionary patches here and there occur, materially interfering with the economical working of the stone, especially when converted by machinery. Minute discoloured cracks, lined by soft ferruginous earth, often very local in their occurrence, or hard veins of mineral matter, much harder than the stone through which they run, are particularly common in the softer freestones. Irregular bands of shelly matter, alternating it may be with courses of large and small particles, are features conspicuous in certain shelly lime-stones. The phenomenon of "false-bedding," however interesting to the geologist, has but little attraction for the architect seeking a homogeneous material. In too many instances the false-bedding is accompanied by changes in tint of the material, and prominent rusty-looking lines, running over the surface of the stone in every conceivable direction, are the inevitable result. The effect, viewed, say 100 yards away, is not bad, and agrees pretty accurately with the circulars wherein such stones are sometimes described as of "golden," "warm orange," "auburn," &c., tints.

Speaking of the connexion between structure and colour of stone reminds us that, in a general way, any serious modification in structure is almost always accompanied by a corresponding change in tint. We may enlarge on this for a moment. Summarising the prevailing colours of building stones and the causes thereof,\* it may be stated that—

*White* usually indicates the absence of heavy metallic oxides, especially iron.

*Black* may be due either to the presence of carbon, or to some iron oxide, or silicate rich in iron.

*Yellow* almost always indicates the presence of hydrated peroxide of iron.

*Brown* very generally, on weathered surfaces, points to the oxidation and hydration of minerals containing iron.

*Red* is mostly due to anhydrous peroxide of iron, and varies in intensity from dark blood-red to pale flesh-coloured tints.

*Green* in crystalline rocks is chiefly owing to the presence of hydrous magnesium silicates; and in sedimentary rocks principally to ferrous silicate.

Sir Archibald Geikie remarks that the mottled character, so common amongst many stratified rocks, is frequently traceable to unequal weathering, some portions of the iron being more oxidised than others; whilst some, on the other hand, become deoxidised from the reducing action of decaying organic matter. To the latter cause may be attributed the circular green spots so often found in red stones.

Interference with the normal tint of stones is very noticeable in the vicinity of large

fossil shells, or small patches of the same, especially in sandstones. The immediate neighbourhood of the shelly matter is nearly always more damp than the non-shelly portions of the stone; it would seem as though the foreign substance had attracted the moisture to it, so speak, and the continued chemical action induced in the extra-saturated portion when the stone built up, tends to render that part of it lighter than the remainder. Precisely similar effects are produced in the vicinity of small concretions prevalent in many building stones; the structure of the material round about them is altered, and the whole becomes softer. The concretions themselves in certain localities are light blue, whilst the stone generally is cream coloured.

An interesting case, in which the passage of moisture was hindered by the presence of veins of calcite, came under our observation at some of the Bath stone quarries not long since. The peculiarity of structure is noticeable in marlstones of the same geological horizon, and once attracts attention in newly-quarried blocks or after a smart shower of rain. The prevailing veins were mostly vertical or horizontal, and blocks where several such occurred in parallel series we noted that their general effect was to hold up the moisture, and where the veins were horizontally disposed, a wet zone occurred above and a dry zone below each vein. Under certain circumstances these veins must, therefore, act as damp-courses in buildings.

Igneous building stones—granite and the like—present many peculiar features in structure when viewed a few feet away that would altogether lose sight of in a hand specimen or in micro-examination. Some Scotch granites, for instance, are roughly foliated, the planes especially having a tendency to follow defined planes, more or less parallel with each other. This structure becomes the more apparent as the material is polished, and its effect on columns is not altogether pleasing, in addition which they must be, to some extent, planes of weakness. An otherwise even-structured granite is sometimes varied by the development of remarkable local patches, which in this case, however, do no harm to the material so far as weathering is concerned, although unsightly from an artistic point of view. In certain thorough crystalline rocks, variously tinted zones—rather lighter than the bulk of the rock—occur, and these may be barely perceptible until the stone is polished. Minute "blind" cracks are frequently developed; caused, it may be, by natural means or during the blasting operations consequent on quarrying. These should be carefully sought in looking at the material. It is impossible to appreciate the real structure of such rocks, or coarse-grained Cornish granite without viewing the stone in bulk. When the rock is porphyritic a hand specimen fails to convey any idea of its structure as a whole.

The manner of fracture, so essential in the production of "rustic face" work, and many other points connected with tooling or masonry can only be judged to advantage in the quarry stone-mason's yard. Marble cannot, as a rule, be selected from samples, either for effect of colour or evenness of polish.

Turning now to the second method of examining structure alluded to—that of viewing building stones with a lens—it may be said that the primary object gained is the ready detection of pyrites and other deleterious minerals in the stone. We get a broad insight into the mode of disposition of the crystals or particles, as the case may be, with reference to each other, providing the grain is not too small. To a limited extent the state of crystallisation then becomes apparent; whilst enables us at a glance to determine the majority of the chief varieties of stone. The microscope cannot be carried into the field, and if it could would be of comparatively little use, as we shall presently see, and the lens is a good substitute therefor in many respects. Hair-like cracks invisible to the naked eye, but which become painfully obtrusive when the stone is built up, are easily seen with a pocket lens. In the case of oolites the condition of the granules can be better seen than when under the microscope, and the relative abundance of foreign matter can be made out.

The third-mentioned method of investigating structure is, however, by far the most important and searching—the examination by aid of the microscope. The particular kind of microscope required for the work, together with the optical properties of a few common rock-forming minerals will be described in our next article. We now mention, however, that for the purposes

\* Based on data given by Geikie, "Text-book of Geology," 1882, p. 92.



investigation it is necessary that slices of each shall be ground down so thin as to render practically transparent. The mode of grinding these sections was fully described in columns on a former occasion,\* and need be further referred to. Every common stone has distinctive optical properties when transmitted light; and by these alone can be satisfactorily determined. The presence of matrix in a fine-grained stone; the whinship that the crystals or particles, however hard to each other; their state of preservation; decay; and a hundred other points tend to indicate apparent anomalies in their behaviour under certain conditions, may be resolved on to the microscope. By its means alone is the chemical composition of building stone rendered intelligible, but the use to which we especially put the microscope is in the identification of building stones which closely resemble each other in outward appearance. That phase utility has never been treated of before.

#### OBITUARY.

**PROFESSOR SOMMER.**—We regret to announce sudden death of Professor Oskar Sommer, of Frankfurt-am-Main. Born in 1840, at Wollenbüttel, and died at the Polytechnic of Hanover, and in the city of Zurich. After taking part in competition for the Cathedral at Cologne, he resided at Berlin until 1869, when he was appointed Lecturer on Architecture at the Technische Hochschule at Frankfurt, a post which he held until his death. He was the designer of a number of public buildings at Frankfurt, amongst them the Stadelsche Institute and the New Bridge (the latter in conjunction with Büning). As responsible for the general plan of the International Electrical Exhibition of 1891, of which he was one of the most active promoters.

#### GENERAL BUILDING NEWS.

**TECHNICAL INSTITUTE, BATHURST.**—On the 28th ult. the Prince of Wales opened the new Polytechnic Institute which has been erected in the Park-road. Physical and chemical laboratories, photograph, art, and music-rooms, with various class-rooms and lecture-halls, have been included in this new building, which is capable of accommodating at one time 1,450 students. The architect is Mr. E. W. Mountford. The building was described and illustrated in our issues for 12th October, and July 23, 1892.

**NEW PREMISES, BRADFORD.**—New premises for the Yorkshire Penny Bank have been erected in the north at the junction of North Parade and Manor Road, from designs by Mr. James Ledingham, architect, of Bradford.

**NEW TECHNICAL SCHOOL FOR HEYWOOD.**—On the 28th ult. Alderman Healey laid the memorial stone of the Heywood Corporation Technical School, which is in course of construction on the Town Hall site. The school is being built by Messrs. Heywood & Bell, contractors, of Hopwood, Heywood, from the plans and designs of Messrs. Heywood & Willoughby, architects, Heywood. It is estimated that it will provide accommodation for nearly 1,000 students. The style of the building is in the Domestic Gothic style, built of brick and stone. The plan is a square, the basement will be three stories in height. The basement will comprise a weaving and spinning room, a class-room, engineering workshop, carpenters' room, and carpenters' chamber. The first floor will contain a science lecture-room, the whole of the top story will be devoted to study of chemistry and art. Externally the building will be faced with Henry Dennis's Ruabon stock bricks. The window leads and sills will be stone, but the remainder of the dressings and other enriched work will be executed in Ruabon stone. It is estimated that the school will cost £7,000.

**ORPHANAGE, LEEDS.**—The Walmesley Orphanage, in connexion with the Brudenell-road Mission Hall, was opened recently. The new building is contained in the Domestic Gothic style, built of brick and stone. On either side of the entrance is a square window, mullioned windows above, with dormer windows on the third floor. The first floor contains an entrance-hall, visitors', children's, and ladies' rooms. On the second and third floors are dormitories, bedrooms, a linen room, bath rooms, lavatories. The dining, kitchen, pantry, store-room, &c., are on the ground floor. The playground adjoins the building, and Messrs. Walmesley's workmen have erected the home from plans prepared by Mr. D. Dodgson, architect.

**REPAIRS TO CHESTER CATHEDRAL.**—We understand that the damage done to Chester Cathedral by the recent gale is more serious than anticipated. The Dean and Chapter have in Sir A. Blomfield, and acting on his advice,

have decided to make the exquisite groining of the inner roof of the Chapter House, on which a dislodged pinnacle fell, more secure, and also to complete the western gable and roof, as Sir Gilbert Scott had advised. The necessary work will entail the expenditure of about £1,000.

**WESLEYAN CHAPEL, READING.**—A new Wesleyan chapel was opened recently at Reading. The interior of the chapel is 60 ft. by 44 ft., with a lofty arched ceiling, divided by moulded ribs into panels, which are decorated. The galleries on either side and over the entrance are fitted with pitch-pine seats, the whole, including the ground-floor, being capable of seating about 700 persons. The organ-loft and choir gallery at the south end are of the same material, the arch being enriched and supported by two stone columns, with carved capitals. A special feature in the chapel is the rostrum, with staircase on each side. The galleries are approached by two stone staircases, connecting and opening into the lobby and vestibule, which are tiled at the front entrance. There is also a rear staircase, admitting of the Sunday-school children passing from the school buildings direct to the chapel; access is also gained from this staircase and entrance to the choir gallery. The chapel and schools, &c., were designed and executed by Mr. F. Boreham, architect, London, and the contract for the completion of the whole of the works in connexion with the chapel was carried out by Mr. Samuel East, builder and contractor, of Reading. The heating apparatus, on the high-pressure system, was supplied and fixed by Messrs. Vaughan & Brown, engineers, of London. The cost of the building, exclusive of the purchase of the land, is about £4,500.

**SCHOOL, BOARD OFFICES, KEIGHLEY.**—Offices for the Keighley School Board have been erected in Cooke-street and Lawtholme-lane, Keighley, from the designs of Mr. James Ledingham, architect, of Bradford.

**NEW PREMISES, NATIONAL DENTAL HOSPITAL, GREAT PORTLAND-STREET.**—The Duke of York, as President of the National Dental Hospital and College, opened on the 24th ult. the new premises of that institution in Great Portland-street, Oxford-street. The new building is of red brick. The various departments include a stopping room for the accommodation of seventy-five patients, special demonstration rooms, a lecture hall, and laboratories. Mr. A. E. Thompson is the architect of the building, the cost of which is understood to have been between £9,000 and £10,000. The various works of heating, ventilation, hot-water supply, and gas services, have been carried out by Messrs. Russell & Co., 42, Berwick-st., Oxford-street, W. The heating is on the low pressure system, with radiators and coils in the various halls, laboratories, and rooms. The hot-water supply to the staff and students' lavatories in the extraction and stopping rooms is worked conjointly from the range and from a special hot-water supply apparatus fixed in the stoker. For the ventilation two main extraction flues have been formed in the building, with cast-iron flue pipes from stoker carried up in each, into which flues from the various rooms are carried.

**PROPOSED GAMBLE INSTITUTE, ST. HELEN'S.**—As many of our readers are aware, it is proposed to erect at St. Helen's a new Institute, the outcome of an offer of 20,000l., and a piece of land containing 15,000 square yards, made by Colonel Gamble, C.B. The committee appointed to carry out the scheme received about thirty sets of plans from various firms of architects in the country, and Messrs. Briggs & Wolstenholme, of Blackburn, were ultimately selected as architects to the committee. Their original plans showed a building four stories high, in addition to basement, but it was found that the erection of such a building would cost more than 20,000l. The architects thereupon prepared new plans for a three-story building, with basement. The main entrance to the building is from Hardshaw-street. The free library will occupy the whole of the ground floor, and be raised about 7 ft. from the street level. The entrance will communicate with a hall, behind which will be the lending department, capable of accommodating 40,000 vols., and divided from the hall by a counter 60 ft. long. The whole of the frontage to Bickerstaffe-street will be occupied by the new room—112 ft. by 32 ft.; while the reference library—52 ft. by 32 ft., boys' reading-room—32 ft. by 20 ft., and girls' reading-room—32 ft. by 18 ft., will occupy the opposite wing. A private room for the librarian is placed between the reference and the lending departments. The entrance to the Technical School will also be from Hardshaw-street, and will correspond with the entrance to the Free Library, they being situated on each side of the central staircase. The technical director's office and waiting-rooms are arranged for on the ground-floor level, communicating direct with the Technical School staircase and the hall of the Free Library. The porter's case and the hall of the Free Library. The porter's room is arranged between the two main entrances overlooking the staircase of the Technical School and the hall of the Library. The basement floor will be devoted to the manual training-room, building class-room, metallurgical laboratory on the Bickerstaffe-street side, with the plumbing class-room and engineering laboratory from the Corporation-street; teachers' room, cloak-rooms, &c., to Hardshaw-street. The centre of the basement floor will be occupied by a book-store in connexion with the library, and will communicate directly with the

ground floor by a private staircase, and also have a small lift for books. A feature of this plan is a covered cartway in Bickerstaffe-street, through which all building material, library, and other stores, and coals will be taken into the building. The rear portion of the cellar is devoted to the warming and ventilating plant, and is separated from the engineering laboratory by glazed screens. It will be lighted from the open space behind the adjoining houses. From the basement floor to the street level and upward to the first and second floors a staircase is provided. Off a mezzanine landing between the ground and first floor the keeper's rooms will be placed. On the first floor, next to Bickerstaffe-street, will be provided the physics laboratory, dark room, and store room; the physics lecture room, with the seating on the amphitheatre plan to accommodate ninety students; preparation room, and two large class-rooms. The wing to Corporation-street on this floor will embrace students' common room, two class-rooms, and the geometrical-drawing room. On this floor will also be placed the cookery and laundry departments, which are so designed that the whole area, 55 ft. by 32 ft., can be used as one room for large demonstrations. A teachers' room, lavatory, &c., and the male students' cloak-rooms will occupy the irregular piece of land on each side of the main stairs; by this site, though irregular, is used to its fullest capacity, while all the working-rooms are square or symmetrical in form. A feature of this and the second floor landing will be an arched dividing the same, which may be filled with glazed screens, thus providing a museum for the preservation of prize exhibits or other articles of interest relating to the work carried on in the Institute. The second floor will be entirely devoted to the chemical and art departments, the chemical laboratory (for sixty students—68 ft. by 32 ft.), balance and combustion rooms, the lecture theatre (to seat ninety, the same as the one on the first floor), and preparation-room occupy the whole wing to Bickerstaffe-street. The modelling, painting, and art masters' room and office are placed in the north lighted wing, facing Corporation-street. The elementary art room—55 ft. by 32 ft.—lighted from both sides, occupies the rear position, the front being reserved for teachers' rooms, ladies' lavatory, &c. The building will be lighted by electricity supplied from the Town Hall. It will be faced externally with red pressed bricks and terra-cotta. The staircase and corridors will be fireproof, the latter being laid in wood blocks, and both having tile dados on the walls. There will be a lift communicating from the basement to the top floor of the building.

#### SANITARY AND ENGINEERING NEWS.

**SEWERAGE SCHEME, CHESTER-LE-STRÉE UNION.**—The Rural Sanitary Authority have adopted a scheme of sewerage and chemical precipitation tanks for the village of Alma, and also sewerage works for Pelton Grange, Blamish, according to plans prepared by Mr. D. Balfour, M.Inst.C.E., F.G.S., Newcastle. The authority approved of the completion of the sewerage and sewage disposal works for Birtley and Edmondsey, and instructed Mr. Balfour to arrange for their now being put into full working operation.

**DRAINAGE OF BURTON SALMON AND BROTHERTON.**—On the 13th and 14th ult., Colonel W. M. Ducat, R.E., held Local Government inquiries at these places respectively into the applications promoted by the Pontefract Rural Sanitary Authority for provision of orders for acquiring lands compulsorily from Sir J. Ramsden, of Byram Hall, for the purpose of sewage disposal. Sir John Ramsden opposed in respect of the particular lands scheduled, but offered other lands in substitution of the same. Mr. Malcolm Paterson, M.Inst.C.E., the Engineer for the schemes, stated that he had no engineering objection to raise against the adoption of the lands suggested by the owner, but thought that in both cases they might be considered open to objection by adjoining owners and occupiers, as being too near the respective villages, and in fact this objection was raised in the case of Brotherton by certain ratepayers, including the vicar. The inspector, however, thought the alternative sites suitable, and they were accepted by the Clerk to the Authority, subject to the sanction of the Local Government Board, an assurance being distinctly given by Colonel Ducat that the application for the provisional order would not be prejudiced by this course.

**DRAINAGE SCHEME, OUGHTIBRIDGE, SHEFFIELD.**—The Wortley Union Rural Sanitary Authority having proposed to carry out a drainage scheme for Oughtibridge, instructed Mr. D. Balfour, M.Inst.C.E., F.G.S., of Newcastle-on-Tyne, to report on the same. At a recent meeting of the Authority, Mr. Balfour presented his report, which embraced alternate schemes, either by disposing of the sewage, by means of chemicals and land, or conveying it to Wadsley Bridge, thence into the main sewers of the Corporation of Sheffield for delivery and disposal. The sewerage of the South Yorkshire Large Asylum is also provided for. The question was adjourned till next meeting, the report to be meantime printed.

**SEWAGE DISPOSAL AT WALSALL WOOD.**—Major-General H. Darley Crozier, R.E., Inspector

\* The Builder, vol. I. (1890), p. 658.



of the Local Government Board, recently conducted an inquiry as to the application of the Local Board for permission to acquire a piece of land belonging to the trustees of the late Mr. Earp, for a sewerage scheme for Walsall Wood, and for leave to borrow 10,000*l.*, the estimated cost of the scheme. The population of the district to be dealt with is 13,703. Of the 2,514 houses, 2,075 are of less than 20*l.* a year value. It was stated that four sets of the plans had been obtained, and on the recommendation of the Surveyor to the Board those of Mr. Nicholls had been selected. That plan would be sufficient for a population of 60,000 persons. The main outfall would be at Shelfield Farm. The system adopted was that of the International Purification Company, and the sewage would be conveyed by gravitation. The plan was capable of enlargement so as to provide for an additional 50 per cent. of population, the present cost being estimated at 7,758*l.* 13*s.* Mr. Alfred Young, for the opponents of the scheme, submitted that it would injure his clients' land to the extent of 5,000*l.*, and that the land proposed to be taken was quite unsuitable. He called Mr. Wilcox, engineer, who had sent in an alternative scheme; Mr. G. Matthews (Birmingham), Mr. G. Brown, C.C., and Dr. Hill. The evidence of these witnesses was that the land was of a clayey peat subsoil, with only a thin surface of earth, and full of water at a depth of about 3 ft. They also stated that it would not give sufficient flow to the effluent from the tanks.

**NEW WORKS AT BARRY.**—According to the *Western Mail*, the engineers' estimates for the construction by the Barry Railway Company of the new railways and other works proposed in their deposited Bill for next session have been prepared, in accordance with the requirements of Parliament. The total cost of the whole of the new works contained in the Bill is set down at £302,232, of which £100,032 is estimated to be required for the two new railways, and £202,200 for the embankment or breakwater, extending from Yorke Rock at the western extremity of Barry Island for a distance of seven chains over the foreshore. Of the total sum required for the railways £70,032 is set down as the cost of the proposed new line, 2 miles 1 furlong 38 chains in length, commencing by a junction with the company's main line 18 miles from Barry, and terminating at a point near the Cymmer Colliery, in Llantrisant. The 30 acres of land required for this line are estimated to cost 13,720*l.*, and the other items of expenditure are as follow:—Cuttings through 215,000 cubic yards of rock and soft soil, 17,750*l.*; tunnels, 6,045*l.*; retaining walls, 1,000*l.*; culverts and drains, 1,250*l.*; one bridge, 600*l.*; accommodation bridges and works, 4,000*l.*; laying down permanent way at 4,800*l.* per mile, 10,548*l.*; permanent way for sidings and cost of junctions, 2,000*l.*; stations, 8,000*l.*; and contingencies, 5,194*l.* From the estimates for this line, which are signed by Mr. James Bell, C.E., it appears that this railway will be a double line throughout. For the proposed railway, 6 furlongs 7 chains in length, from a point near Barry Station to a point near the junction of Ivor-street with Plymouth-road, Mr. J. Wolfe Barry, C.E., estimates that the sum of 30,000*l.* will cover the whole cost of construction, of which 14 acres 3 rods 7 perches of land required for the line will absorb 1,800*l.*; cuttings through soft soil, 14,021*l.*; two bridges, 3,300*l.*; culverts and drains, 1,550*l.*; pitching slopes, 500*l.*; permanent way, 4,268*l.*; stations, 2,000*l.*; and contingencies, 2,551*l.* This railway will also be a double line throughout.

**NEW BRIDGE, WOOLER, NORTHUMBERLAND.**—A new iron bridge across the Wooller Water has been opened for traffic. The engineers were Messrs. J. Watt Sandeman and Moncrieff, M.M. Inst. C.E., Newcastle, and the contractors were the Stockton Forge Company. The main girders are of the bowstring type, the entire structure being of mild steel and capable of carrying a 20 ton roller. The clear span is 80 ft., and the roadway has a clear width of 15 ft. The flooring consists of cross and longitudinal girders, covered by buckle plates. The foundations are of concrete, the stone being obtained from a local quarry. The bridge has been built to satisfy the requirements of the County Surveyor, Mr. H. S. Kynerley.

**SEWERAGE WORKS, ASHFLEY DOWN, NEAR BRISTOL.**—At a recent meeting of the joint committee, consisting of representatives from the Horfield Local Board and Barton Regis Rural Sanitary Authority, appointed for the purpose of dealing with the sewerage and sewage disposal of the respective districts governed by the above boards, it was reported that the assent had been given of the Local Government Board to the scheme over which an inquiry had been held by Colonel Ducat, in the previous month. The Local Government Board had approved of the whole scheme without any modification. The engineer, Mr. A. P. I. Cotterell, C.E., was instructed to at once go forward with the preparation of the necessary plans.

**ENGINEERING WORKS, ARBINGDON UNION WORKHOUSE.**—New boilers and appliances for cooking, laundry purposes, and heating the union workhouse by steam, have recently been carried out by Messrs. Wood Brothers, of Brockley, from plans and specifications prepared by Mr. George Winslip, A.M. Inst. C.E., of Borough-buildings, Arbingdon.

The scheme provides for the fixing of radiators in the several wards, boiling-pans and steamers in the kitchen, and the usual provisions for the laundries. The cost has been about 1,000*l.*, and the saving will be upwards of 100*l.* per annum.

### FOREIGN AND COLONIAL.

**FRANCE.**—During the present session of the Municipal Council of Paris, consideration is to be given to the provision of underground conveniences for Paris, similar to those recently carried out in London.—A crematorium, similar to that at Père Lachaise, has been constructed at Grenoble.—An exhibition of Decorative Art is to be held at Nancy on June 14, to remain open a month.—A society "for promoting the culture of the Arts," has been formed at Aix, in Provence, in imitation of the society presided over by M. Louis Gautier.—A rich merchant of Marseilles, M. Moricelli, has given a million francs to the town of Carpentras for the construction of a Hôtel de Ville.—A subscription has been opened to raise a monument to Cardinal Laviegre in the Cathedral of Carthage.—The death is announced, at Gennevilliers, of the painter Gustave Caillebotte, one of the most ardent promoters of the Impressionist movement. His *début* in eccentric painting made some sensation about fifteen years ago, but he had retired from the field, and made no further appearance in exhibitions for some time past, though only forty-six at the time of his death.—Last Sunday a strategic railway line with narrow gauge was opened from Brest, connecting the port of Brest with the estuary of Aber Vrach, one of the most important points of Brittany, and a frequent rendezvous for the torpedo-boat flotilla. The town of Morlaix, which has opened a competition for the artistic decoration of eight panels in the Municipal Theatre.—A society has been started in Paris for founding a "Musée Religieux," the date of opening of which, however, is not yet fixed.—The General Committee for the 1900 Exhibition has notified that it is indispensable, for the arrangement of the Exhibition on the Esplanade des Invalides, that the intended station at this point (the terminus of the line from Moulins) should be covered over in such a manner of construction that temporary structures may be erected on the top of it; and that the line itself must be kept 6*m* 50 centimetres below the pavement level of the Quai d'Orsay.

**SWITZERLAND.**—At a recent meeting of the Zurich Society of Engineers and Architects, M. Waldner, editor of our contemporary, the *Schweizerische Bauzeitung*, was elected president, and M. Metzger vice-president. A commission, consisting of six architects and sixteen engineers, was appointed to ensure the proper representation of the society at the Swiss national exhibition to be held at Geneva in 1896.

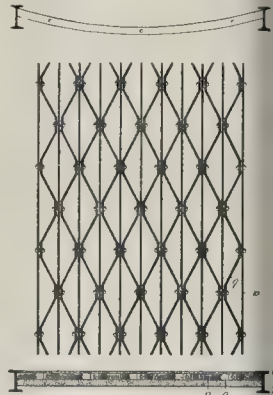
**BELGIUM.**—The Belgian Government has recently appointed M. A. J. Wauters to be one of the members of the executive committee of the Royal Galleries of Painting and Sculpture. M. Wauters is known here in this country by his "History of Flemish Painting," which has been translated and published on January 1, treats of the work of Hans Memlin, and has aroused much interest, owing to the author's discovery of a hitherto-unknown masterpiece at the monastery of Najera, in the north of Spain, in merit second only to Memlin's known works at the Hospital of St. John at Bruges. It is also shown in this book that the artist, as has hitherto been supposed, a Fleming by birth, was born at a little village near Mayenne. M. Wauters is not only an art critic but a great traveller and geographer; he is Secretary-General of the Belgian Industrial Companies of the Congo, and editor of the "*Mouvement Géographique*" and of the "*Congo Illustré*," as well as the author of several works on Central African matters. The next archaeological Congress will take place in June at Mons, under the presidency of General Wauvermans.

**GERMANY.**—The "Arts and Crafts" exhibits from the North American section of the Chicago Exhibition, which were purchased by the Prussian Government, are now being shown at the Arts and Crafts Museum at Berlin. The exhibits comprise furniture, silver, glass, carpets, basket-work, tools, iron-work, locks, and a remarkably complete collection of electric-lighting arrangements.—The colleagues and pupils of Professor Ernst Curtius, lecturer on Greek Archaeology at the Berlin University, intend to commemorate his sixtieth birthday, which falls this year, by erecting his bust in the museum at Olympia. The Greek Government have readily given the required permission, seeing that the success of the excavations at Olympia is in a great measure due to his efforts.—The names of the members of the "hanging committee" of this year's Berlin Art Exhibition are now published. Herr H. Grisebach is the architectural representative.—Professor Dumichen, the well-known Egyptologist, has died at Strasburg, at the age of sixty-one. He was the author of a number of works on ancient Egyptian buildings and inscriptions. His work on the Temple of Denderah is, perhaps, best known.—The annual Art Exhibition at Munich will be held this summer as usual. In the invitations sent out the committee draw attention to

the fact that exhibits are to be limited to "production in its most noteworthy form," as annual exhibitions are assuming a too extensive character.—The municipality of Munich has enriched to the extent of 1,000,000 marks under will of Engineer Karl Müller; the amount is to be used for the erection of public baths in that city. The Government of Baden has decided to erect observatory on the Gaisberg, near Friburg. An American lady has given 2,000*l.* towards the chase of the necessary instruments.—The chapel of the Moritzburg is to be restored in commemoration of the two-hundredth anniversary of the foundation of Halle University. Funds are forthcoming for the erection of the statue of Richard von Volkmann, the renowned surgeon, which will be set up at the entrance to the surgical school.

### MISCELLANEOUS.

**CONCRETE AND IRON CONSTRUCTION.**—An annexed cut represents a form of light wrought-iron frame patented by Herr Dedreux, of Munich, the embedding in concrete, either in floor partitions. The iron is in three pieces placed edge in the framework, which can be made measurement at the manufactory and sent into



Dedreux' Iron-Framing for Concrete Partitions.

building ready to be fitted in its place. With quite willing to draw attention to it, as it has brought under our notice specially, but do not think it is superior to some other combination of steel or iron and concrete which are already in use in this country. It is being largely used, understand, in Munich.

**PROPOSED REREEDS, SWYMBRIDGE CHURCH, DEVONSHIRE.**—It is proposed to erect a reredos in Swymbridge Church in memory of the late Mr. Smith, Messrs. Harry Hens & Sons, Exeter, the work in hand. It will be of the same character as the main architectural feature of the church and will be made wholly of polished marbles, alabaster of bright warm colour. The group of statues which will fill the panels and niches will be of pure white Castellino marble.



**THE "EAGLE" CHIMNEY-PIPE.**—This chimney-top, of which a section is shown, is specially designed to prevent down-drafts. The construction will be easily understood by section. The chimney-pipe stands 6 in. within the hexagonal case; 6 in. above the pipe-top is a disc of diameter 1 in. greater than the pipe, and about 1/2 in. thick. The disc works up and down in the slots (of which there are three) to a level with the sweep's brush. With special trouble some the chimney disc can be set at any height over the pipe that gives the desired results. It does not give way to the sweep's brush. The chimney is made and patented by the Eagle Range Foundry Company.

**REREEDS, ST. PHILIP CHURCH, CHEAM COMMON, SURREY.**—A carved oak reredos, with statues



anelled wings, has been presented to this, forming memorials to two parishioners. The proper contains paintings as follows: a three centre panels, the Supper at Emmaus, and on the shutters, two on either side, figures of St. Philip, the patron, and St. Ignace, the patron of Cheam, and on the two panels foliated designs carrying the arms of Surrey and Winchester, all on grounds of gold. These paintings are the work of Mr. J. Westlake, F.S.A. The wings contain panels of elaborate and varied character, above is carved a series of shields bearing the emblem of Our Lord's Passion. A richly-moulded of nine arches resting on the altar-shelf, a block of Irish green marble, supported on red Cornehill corbels, sustains the central of the reredos, which is a fixture. Both the wings have inscriptions in Lombardic. The oak work and carvings are by Mr. N. de Vauxhall, the whole having been carried out by the designs and under the personal supervision of Mr. E. Swinfen Harris, architect, of

OTHER REVERSIBLE WINDOW.—In reference to last week on a window-cleaning safety device, we remarked that reversible sashes probably the best expedient, Messrs. Gray & Co., of Egham, have sent us a model of one has a good deal of merit for simplicity and ease. The rebate or groove in which the work is made on one side of the window is deep deeper than on the other, and the sash is secured by screws, passing in parallel with the plane of the glass, and pressing against a plate in the side of the sash, pressing them up tight the pressure can be so as to render the sashes immovable, is the method of securing them, no form of being required. This pressure of the screws to prevent the sashes from rattling in a wind. When, on the other hand, it is to take the sashes out for cleaning, the mentioned screws are loosened until the sash is pushed so far into the deep groove on the other side as to pass out of the groove on the other then it is easily reversed for cleaning, the being long enough to admit of this. The top of the sash is brought down to the bottom to be as has to be turned outward instead of before it can be drawn in, which may be backward. The patentees observe that in the case of these screws by which the sash can be turned up, it is not necessary to fit the sash so closely as is usually required. This might be another way; the sash could not easily be turned if it were fitted very accurately to the rebate, though the tightening screws prevent shaking, and would fear that in windy weather it would be rather draughty sash. It has, however, a deal of merit, and is worth attention.

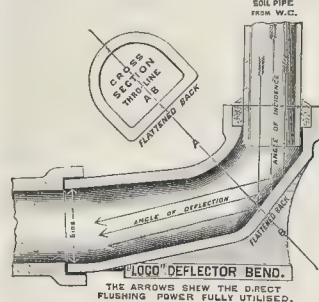
MEYORS' AND AUCTIONEERS' CLERKS' PROVISIONAL ASSOCIATION.—We have received the annual of this Association, from which we learn that the number of members has increased. The management and the sick fund have been nearly doubled by the interest investments. The annual meeting of members and subscribers is to be held at the Marton on Wednesday, the 7th.

STON MASTER BUILDERS' ASSOCIATION.—At annual meeting of the Brighton Master Builders' Association was held on the 21st ult., at Brighton Town Hall, Alderman Botting, J.P., in the chair. The report showed that the membership of the Society was now eighty-seven. Alderman J.P. was re-elected chairman; Mr. J. Garrett was appointed vice-chairman; and Messrs. Barnes, Parsons, Willett, Longley, Patching, Wright, and Willmer. Mr. George Lynn was elected treasurer, Mr. C. Lynn, jun., hon. secretary, and Messrs. H. Manwaring and F. T. auditors.

ARCHITECTURE.—On the 13th ult., Alderman H. Rathbone lectured at the Ficton Lecture Hall, William Brown-street, Liverpool, on "The Buildings of Liverpool and Other Great Cities of the World." After stating that buildings were the expression of the life of a city, the lecturer said: "The importance of cities having really fine buildings is great, but I don't think we in England realise it. To realise it is to build a city in which it is a really fine building is a permanent source of wealth. In the first place it is a public element that round it are grouped an intelligent and industrious population, who had the sense to build it. A great public building is not only a source of wealth, and between the lines. Unlike a book, or picture, it cannot be the work of a single genius. The genius of the architect requires the aid of great and varied skill. Such a building is an element of permanence which is of great importance to the prosperity of a city. Most great cities have passed away, and those which have not have passed away. . . . The poorest citizen of a great public building belongs to him as the richest and most powerful of his fellow citizens. The artisans feel that they made it; they or their forefathers, to pay for it. They are proud of it—are proud of being of the town which has raised it. As English-

men we are proud of the Houses of Parliament. We compare them with the Chamber of Deputies in Paris, and we feel their noble architecture to be a proof that we are proud of our Parliamentary institutions, with their long history and unbroken power. The Parisian is proud of being a Parisian. Paris believes in Paris, and therefore it is that the Town Hall of Paris, not the Chamber of Deputies, is the great building of their city. They spared neither expense nor genius nor energy in making their Town Hall the finest in the world. If you would inquire which cities in England have most life and vigour, you will find them to be those which are raising noble public buildings to declare their present prosperity, and ensure their future duration. But this cannot be accomplished without the aid of educated artisans. It is therefore the duty of the city to secure the education of those classes of artisans necessary to ensure architectural success. I think we are, awaking to this. We are about to establish schools for those arts connected with the mother of them all—architecture; and when they are established I hope the city will be enabled to assist in finding employment for their students. It is very sad to think of the amount of genius in our nation which we know to have been wasted and lost through the absence of opportunities, genius which would have tended to make our nation greater and nobler than it is. However great the genius of an architect may be, he requires the earnest and enthusiastic help of his fellow-citizens. Architecture is a national branch of art as distinguished from individual branches. The lecture was illustrated by numerous lantern pictures of famous buildings throughout Europe.

SANITARY APPLIANCES.—We have received from Mr. F. C. Lynde, Consulting Sanitary Engineer, of Manchester, a book of illustrated sheets of various



improvements in sanitary appliances devised by him. Some of these are very good, and there is a general good standard of work indicated in the illustrations.

though we do not see that all things claimed as improvements are so. We are very doubtful, for instance, about Mr. Lynde's favourite form of trap with an angle at the bottom instead of a bend, and are at a loss to understand what benefit is expected from it, though the general make seems very good, and the broad and solid stand or basis for the trap is a good feature. The form of bend called the 'deflector bend,' which we give an engraving, seems to have a practical value. The carriage-drive grid, with an arrangement for keeping sand out of the trap is good; by the construction of the top a sufficient catchplate for the sand is provided around the water outlet, which stands above it. The appliances are specially distinguished as the 'Loco' Sanitary Appliances.



## MEETINGS.

FRIDAY, MARCH 2.

Architectural Association.—Mr. S. B. Beale on "Colour in Street Architecture." 7.30 p.m.  
Sanitary Institute (Lectures and Demonstrations for Sanitary Officers).—Mr. Charles Mason on "Scavenging, Disposal of House Refuse." 8 p.m.  
Institution of Civil Engineers (Students' Meeting).—Mr. Herbert W. Umney on "Efficiency and Economy of Elevators." 7.30 p.m.

SATURDAY, MARCH 3.

Architectural Association.—(1) Visit, at 1.45 p.m., to the United Service Institution, Whitehall. (2) Visit, at 3.15 p.m., to the new Admiralty Offices, St. James's Park.  
Builders' Foremen and Clerks of Works' Institution.—Annual Dinner, Holborn Restaurant. 6 p.m.

Sanitary Institute.—Visit to East London Waterworks, Lea Bridge. 1.30 p.m.  
Royal Institution.—Lord Rayleigh on "Light, with Special Reference to the Optical Discoveries of Newton." 4.30 p.m.  
Queen's College, Cork.—Mr. Arthur Hill on "The History of Architecture." VIII. 3 p.m.

MONDAY, MARCH 5.

Surveyors' Institution.—Mr. Howard Martin on "The Report of the Local Government and Taxation Committee of the London County Council on the Subject of the Rating of Ground Values." 8 p.m.  
Society of Arts (Cantor Lectures).—Mr. Hugh Stannus on "The Decorative Treatment of Artificial Foliage."—III. 8 p.m.  
Victoria Institute.—8 p.m.  
Liverpool Architectural Society.—Paper by Mr. James H. Cook, entitled "Three Years' Architectural Life in America." 6.30 p.m.  
Leeds and Yorkshire Architectural Society.—Exhibition of Architectural Drawings. 7.30 p.m.

TUESDAY, MARCH 6.

Institution of Civil Engineers.—Further Discussion on Messrs. J. H. Greathead and F. Fox's paper on "The Liverpool Overhead Railway," and Mr. T. Packer's paper on "The Electrical Equipment of the Liverpool Overhead Railway." 8 p.m.  
Sanitary Institute (Lectures and Demonstrations for Sanitary Officers).—Professor A. Wynter Blyth on "Diseases of Animals in Relation to Meat Supply; Characteristics of Vegetables, Fish, &c., unfit for Food." 8 p.m.  
Society of Biblical Archaeology.—8 p.m.  
Glasgow Architectural Association.—Annual Business Meeting. 8 p.m.

WEDNESDAY, MARCH 7.

Carpenters' Hall, London Wall (Free Lectures on Matters Connected with Building).—Mr. T. E. Collett on "The Imperial Institute." 8 p.m.  
Sanitary Institute (Lectures and Demonstrations for Sanitary Officers).—Visit of Inspection in the Parish of St. George's, Hanover-square. 2 p.m.  
Edinburgh Architectural Association.—Mr. T. A. Croal on "The Man in the Street; a Non-Professional View of Architecture." 8 p.m.  
Institution of Civil Engineers of Ireland.—Meeting at 35, Dawson-street, Dublin. 8 p.m.  
Society of Arts. Prof. Carl Linde, of Munich, on "Refrigerating Apparatus." 8 p.m.  
British Archaeological Association.—(1) Mr. Allan Wynter, F.S.A., on "Another Great Seal of Charles II., and Supplementary Information Respecting other Great Seals of England"; (2) Mr. J. T. Irvine on "Discoveries in Repton Church." 8 p.m.

THURSDAY, MARCH 8.

Institution of Electrical Engineers.—Mr. W. M. Mordey on "Parallel Working through Long Lines." 8 p.m.  
Society of Antiquaries.—8.30 p.m.

FRIDAY, MARCH 9.

Sanitary Institute (Lectures for Sanitary Officers).—Dr. W. H. Hamer on "Infectious Diseases and Methods of Disinfection." 8 p.m.

SATURDAY, MARCH 10.

Sanitary Institute (Lectures and Demonstrations for Sanitary Officers).—Visit to Sewage and Destructor Works, Ealing. 2 p.m.  
Royal Institution.—Lord Rayleigh on "Light, with Special Reference to the Optical Discoveries of Newton." V. 3 p.m.  
Edinburgh Architectural Association.—(1) Visit to Chancelot Roller Flour Mill, Bonnington. (2) Visit to Pilrig House.  
Queen's College, Cork.—Mr. Arthur Hill on "The History of Architecture." IX. 3 p.m.

## RECENT PATENTS:

### ABSTRACTS OF SPECIFICATIONS.

4,919.—COMBINED SCREW AND NAIL: H. E. A'Hearty (New Zealand).—According to this invention, instead of manufacturing a screw with a worm from the end to within a short distance of the top, the improved method makes the worm commence at such a distance from the end as to occupy about a third of its entire length, leaving the remainder of the surface below it without a worm and the end sharp pointed, so as to admit of its being readily driven up to or a little beyond the worm into the material, and from there turned with a screwdriver as at present.

5,016.—HEAT IN FIREPLACES, &c.: D. W. Cuthbert.—This invention utilises the known properties of certain salts, such as acetate of soda, or of common salt, or of strong solutions of the same to give out the heat again more or less slowly, according to modes of application, which are described in the specification.

5,114.—APPARATUS FOR MAKING SANITARY PIPES: H. J. & A. Coulthurst.—In the machinery used in the clay is forced, and in which the socket of the pipe is formed is altered and improved with a view to making a better joint and for cutting off the pipe when formed.

6,263.—COMBUSTION OF FUEL: W. P. Bonwick.—A tube or chimney of fireclay or such like material is, according to this invention, placed amongst the fuel, and forms a means of conducting the draught upward, so as to quickly draw up the fire.

6,547.—VENTILATORS: H. L. Hansen and another.—In automatic ventilators (those in which the wind, striking the outer surface of the baffle plates, creates the suction or upward current in the shaft) the baffle plates are made in a curved form from the bottom to the top of the ventilator, or they are bent into hexagonal or other form. These baffle plates themselves form the hood or cow.



[ yd, lot yard, &amp;c.]



HEMEL HEMPSTEAD.—For the erection of police station,  
Mr. Urban A. Smith, General Contractor.

J. H. Mollett .....	£5.983	Edwd. Horn.....	£4.450
Dove & Co. ....	5.045	N. I. Linsell.....	4.430

Smith and Son .....	4,666	Honour & Sons .....	3,028	
Stanton .....	4,680	Jay, Payne, Hemm .....	4,384	
St. Dupont .....	4,950	Hempstead .....	3,982	
St. John .....	4,971	.....	.....	
HOVE.—Accepted for warehouse and stabling, for the Brighton and Hove Co-operative Supply Association, Limited, Messrs. Hammon & Son, Brighton, architects .....				
J. Barnes, Brighton .....	£9,121	0	0	
LONDON.—For erection of a test-weighing station at the works on, Londonbradford-street, for the Guardians of St. Marylebone Union. Mr. A. Saxon Smith, architect .....				
Extra for glazed wall				
Thet. Nye .....	£370	to	£38	
K. Verby & Sons .....	340	0	25	
Mullies Bros. .....	270	10	20	
Leah & Co. .....	230	10	20	
R. F. Chubb .....	200	0	21	
D. H. Chubb .....	200	0	21	
Thos. Benson .....	185	0	10	
H. Wall & Co. .....	274	0	14	
J. H. Nevill, Finchley .....	213	0	12	
Accepted .....				
LONDON.—For alterations and additions to the workhouse, 25, End, Hampstead N.W., for the Board of Guardians of the Corporation of the Parish of St. John, Hampstead. Mr. C. R. Hancock, architect .....				
Herpe .....	£3,700	to	£3,150	
Thompson .....	2,407	0	Burford & Son .....	2,140
Parish .....	2,350	0	Ballard .....	2,130
Att .....	1,750	0	.....	.....
LONDON.—For the erection of new church of St. Andrew, Harold Park, Hildgate. Mr. P. Hammond, architect, 1, Circus-ade, London Wall .....				
Woodward & Co. .....	£8,400	£710	£305	
H. E. E. .....	8,200	312	292	
Dove Bros. .....	7,975	625	335	
Parish & Tollerham .....	7,975	944	181	
Canford & Grand .....	7,975	812	192	

J. S. Scott ..... 6,673\* .... 974 . . 183  
\* Accepted.

C. Deductions of Bath stone dressings.

Circus-place, London Way. N. Mr. P. Hammond, architect,  
 & H. Cocks..... £1,035  
 George Cox..... 977  
 Godson & Sons..... £795  
 Dove Bros. (accepted)..... 735

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LONDON.—For alterations and additions to 104, 105, 106, Leaden-  
 hall-street. Messrs. Wm. Eve & Son, architects, 10, Union-court,  
 Broad-street, E.C. :—  
 & H. F. Higgs..... £1,804  
 Harris & Wardrop..... £1,710

LONDON.—For factory, stabling, &c., Whitechapel, for Messrs. Carey & Tonge. Messrs. Wm. Eve & Son, architects, 10, Union-st., Old Broad-street, E. C. —

..... £7,200	Chessum & Son .....	£6 8 3
Mudry & Son .....	Kilby & Gayford .....	6,684

LONDON.—For extension of stabling at York Mews, City-road,  
Messrs. Martin & Allen. Messrs. Wm. Eve & Son, archi-  
tects, 10, Union Court, E.C.4.  
Murray & Son, ..... £26 | Eaton & Co., ..... £863

LONDON.—For erecting residence at Shepherd's Hill, for  
J. D. Nelson, Mr. Walter Graves, architect, Winchester  
House, E.C. Quantities by Mr. George Francis, 20, Finsbury  
Square—

Edison & Co. ....	£4,400	Houghton & Son .....	£4,097
Over & Son .....	4,361	Kearly ..	4,085
Widdington & Co. ....	4,337	Burnin & Sons .....	3,003

Tris & Wardrop.....	4,130	Cottrell .....	3,904
Man & Fotheringham	4,121	Maxwell Bros. ..	3,499

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LONDON.—For the erection of a block of flats and shops, "North  
 use," No. 5, 6, and 7, Sloane-street, Belgravia. Mr. Alfred J.  
 architect, 17, Sloane-street, S.W. Quantities by Messrs. J.

S. J. Jerrard .....	25,600	£300
Moviem & Co. ....	25,000	183
Foster & Dickson .....	24,374	185
Shults .....	23,859	240
Lutley Bros. ....	23,577	230
Holiday & Greenwood .....	23,333	153
Boyd .....	22,840	230
Nimble .....	22,845	248
Johnson & Co. ....	22,800	248
Perry & Co. ....	22,463	248

LONDON.—For alterations, &c., at 15, Newcastle-street,  
 London-street, for Mr. T. H. Collyer:—  
 ley ..... £212 0 | Thos. Watson, Dul-  
 don..... 188 14 | wich (accepted) ..... 187 0

Shantler, for Mr. F. Gilling. Mr. S. James, architect, Upper  
Loughdon  
J. Howlett & Son.....£800 0 0  
[No competition.]

ed & Sons.....	£2,270	William Pearce .....	£1,995
y & Co. ....	2,210	Kilby & Gayford .....	1,680
Edward & Co. ....	2,240	Colls & Sons .....	1,872



LONDON.—For alterations and additions to Nos. 61 and 63, Ryelane, for Messrs. Davis Bros. Mr. John Jas. Downes, architect, 11, The Parade, Lewisham High-road, S.E.  
R. Super ..... £150 0  
H. L. L. & Son ..... 131 0  
W. Parker ..... 475 0  
S. R. Best ..... 427 0  
W. Champion (accepted) 375 0

LONDON.—For alterations and repairs at 8, 8a, and 91 Wilkes-street, Spitalfields. E. Mr. George J. Amb. architect.—  
H. L. L. & Son ..... £240 0  
W. Parker ..... 237 0  
F. & J. Woods ..... 255 0  
Cousell Bros. .... 153

LONDON.—Accepted for new shop front and interior fittings, for Messrs. Evans & Davies, 37, Falcon-road, Clapham Junction.—  
Martin D. Willis ..... £250 0

LONDON.—Accepted for forming basement under shop, 351, Edgware-road, for Messrs. Chapman.—  
F. T. Clench ..... £365 0

MYNODDISLWYN (Mon).—Accepted for additions and alterations to Abercrom, Crumlin, and Ynydd school buildings, for the School Board. Mr. George Rosser, architect, Albion Chambers, Newport. Carried by the architect.

Albermar, &c., Abercrom Schools.  
Thomas Williams, Newbridge, near Newport, Mon. .... £120 0

W. F. Lewis, Merthyr, S. Wales ..... 18r to 11  
Albermar, &c., Ynydd Schools.  
Davies Bros., Abercrom, near Newport, Mon. .... 74 13 0

PLAISTOW (Essex).—For tar-paving playgrounds and yards, Grange-road, for the West Ham School Board. Messrs. J. T. Newman & Jacques, architects, 2, Fen-court, London, E.C.—  
Lagdon & Crawford ..... £480 0  
W. Smith ..... 420 0  
W. Morris ..... 414 0  
Bensted & Son ..... 425 0  
March & Co. .... 372 0  
Asphalte Limestone ..... 344 8 0  
Hobman & Co. .... 395 0 0  
Constable & Co., City ..... 319 0 0  
Accepted.

FLECK (Staffordshire).—For the erection of house, Fleck, near Walsall, for Mr. Joseph Corbett. Mr. H. E. Farmer, architect, Darlaston. Quantities by architect.—  
H. Gough ..... £1,035 0 0  
F. Lindsay Jones ..... 1,195 0 0  
Wm. Lewis ..... 1,100 0 0  
Francis & Tranter ..... 1,200 0 0  
Darlaston Bms. .... 1,010 0 0  
Accepted.

SELBY.—For deepening an artesian well, at the waterworks, for the Local Board. Mr. W. Curry, Surveyor, Town Hall, Selby.—  
Vivian Boring and Exploration Company ..... £40 and £1 per foot below 550.  
Chapman & Sons ..... 288 and £1 18s. 6d. per foot below 550.  
John Thom ..... 330 and 35s. 36s. 37s. 38s. and 39s. below 550 ft.  
C. Rhodes & Sons ..... 300 and £1 25s. per foot below 550 ft.  
E. Timmins & Sons, Runcorn ..... 300 and £1 per ft. below 550 ft.  
Accepted.

WAINFLEET ALL SAINTS (Lincoln).—For the construction of cattle and sheep market, for the Market Company. Messrs. Jas. Martin & Sons, surveyors, Wainfleet, Lincoln.—  
Thomas Eimes ..... £285 15 5  
J. T. Turner, Wainfleet (accepted) ..... 284 6 0

WAKEFIELD.—For the construction of main pipe sewer and surface water drain, Lincoln-treat, Alverthorpe. Mr. Frank Massie, C.E., Telford House, Wakefield.  
L. Booth ..... £188 9 2  
A. & W. N. Meston ..... 184 16 4  
Garforth Bros. .... 179 0 0  
M. Arundel ..... 169 21 6  
T. & G. Wilson ..... £159 15 0  
W. Doleman ..... 151 14 6  
H. Barnardlong ..... 148 3 5

WEST HAM.—For the construction of 1,000 ft. roads and sewers, Stratford, for the School Board. Messrs. J. T. Newman & Jacques, architects, 2, Fen-court, E.C. Quantities by Messrs. R. L. Curtis & Son.—

Holbrook-st., Manor-road.  
G. Sharpe ..... £1,370 0 0  
R. Kelly ..... 1,600 0 0  
W. J. M. Lison ..... 1,795 0 0  
Lagdon & Crawford ..... 1,633 0 0  
S. Kavanagh ..... 1,691 0 0  
Jesse Jackson, Leyton ..... 1,484 0 0  
S. Griffin ..... 2,330 0 0  
Gregor & Son ..... 2,167 0 0  
J. Burrell ..... 1,830 0 0  
F. Adams, Wood Green ..... 1,467 0 0  
Accepted.

WOKING.—For additions, &c., to various schools for the School Board. Messrs. Welman & Street, architects, Guildford. All localizing.—  
C. Field ..... £553 12 1  
M. J. Millard, Woking\* ..... £189 0  
Accepted.

WOLSTANTON (Staffs.).—For the erection of board school for 265 infants and 600 mixed scholars, for the Wolstanton School Board. Mr. A. R. Wood, architect, Tunstall.—  
Chas. Cope, Tunstall (accepted) ..... £6,584 0 0

WOLVERHAMPTON.—For the erection of house and business premises, Stafford-street, Wolverhampton, for Mr. Wm. D. Forsyth, Mr. H. E. Farmer, architect, Darlaston. Quantities by architect.—  
F. Lindsay Jones ..... £1,300 0 0  
R. Jones ..... 1,157 0 0  
Francis & Tranter ..... 1,085 0 0  
Hammond Bros. .... 1,090 0 0  
Thomas Tildesley\* ..... 970 0 0  
Accepted.

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## TO CORRESPONDENTS.

G. W. F. O. F. (we do not understand your communication).—"Cousin Jack" it is hardly possible for any one to give an opinion except by injecting the work itself. There might be two or three different causes of failure.

All statements of facts, lists of tenders, &c., must be accompanied by the name and address of the sender, not necessarily for publication.

We are compelled to decline pointing out books and giving addresses.

NOTE.—The responsibility of signed articles, and papers read at public meetings, rests, of course, with the authors.

We cannot undertake to return rejected communications. Letters or communications beyond mere news-items, which have been duplicated for other journals are NOT DESIRED.

All communications regarding literary and artistic matters should be addressed to THE EDITOR; those relating to advertisements and other exclusively business matters should be addressed to THE PUBLISHER, and NOT to the Editor.

## PUBLISHER'S NOTICES.

Registered Telegraphic Address, "THE BUILDER," LONDON.

THE INDEX and TITLE-PAGE for Volume LXV. (July to Dec. 1893) were given at a supplement with January 1904. CLOTH CASES for Binding the Numbers are now ready, price 2s. 6d. each; also

READING CASES (Cloth), with Springs, price 6d. each. THE SIXTY-FIFTH VOLUME of "The Builder" (bound), price Twelve Shillings and Sixpence, is now ready.

SUBSCRIBERS' VOLUMES, on being sent to the Office, will be bound at a cost of 6d. each.

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SITUATIONS VACANT, PARTNERSHIP, APPOINTMENT, SHIPS, TRADE AND GENERAL ADVERTISEMENTS. Each additional line (about ten words) under ..... 4s. 6d.

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FOUR LINES (about thirty words) or under ..... 2s. 6d.

Each additional line (about ten words) ..... 6d.

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\*Stamps must not be sent, but all small sums should be remitted by Cash Registered Letter, or by Postal Order, payable to DOUGLAS FOURDRINER, and addressed to the Publisher of "THE BUILDER," No. 46, Catherine-street, W.C.

Advertisements for the current week's issue are received up to THREE o'clock p.m. on THURSDAY, but "Classification" cannot be guaranteed for any which may reach the Office before 10 a.m. on ONE p.m. on that day. Those intended for the front page should be in by TWELVE noon on WEDNESDAY.

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### Darlington Municipal Buildings Competition.



THE invitation of the Mayor and Corporation of Darlington to architects to compete for the erection of the new Municipal Buildings has met with a hearty response from the profession, due, doubtless, in a large degree to the ample time allowed for the preparation of drawings. The large number of designs submitted (eighty-four in all) are well exhibited during the present week in the Corn Exchange, and are remarkable for the very high average of skill, both in planning, design, and draughtsmanship exhibited by the great majority of the competitors. This must have rendered the task of the assessor, Mr. MacVicar Anderson, a difficult one, except perhaps in the case of the first premiated design, which has very marked points of superiority over all others. Naturally, the good people of Darlington are well pleased that two out of the three designs premiated, in accordance with the award of the assessor, are by local architects. The first premium is given to Messrs. Clark & Moscrop, of Darlington, motto "Ad Rem"; the second to "Practical," the joint production of Mr. H. A. Cheers, of Twickenham, Mr. James Aspinall, of Blackburn, and Mr. Joseph Smith, also of Blackburn, whilst the third premium is allotted to the veteran Darlington architect, Mr. G. Gordon Hoskins, for his design under motto "Santa Claus."

The site has frontages to three streets, Horse Market to the front, Houndgate at the rear, and Feethams on the long side, and, as utilised in the first premiated design, is amply sufficient for the accommodation required.

Messrs. Clark & Moscrop's design, by keeping the building close up to the frontage, and by compact planning, obtains the great advantage of a drive from Houndgate and Feethams, which enables carriages to set down under cover within the site, gives standing room for carriages, and provides ample lighting over the most difficult part of the site.

The Municipal Buildings consist of two distinct portions, a public hall and municipal offices, including council chamber, Mayor's parlour, and reception room. These distinct portions the authors of the first premiated design have kept distinct, separating them by the carriage drive from

Feethams, already referred to. The Municipal Offices are placed at the Horse Market end of the site, and the Public Hall at the Houndgate end.

On the ground floor of the Municipal Offices block, entering from the chief municipal entrance in Horse Market, the Town Clerk's offices are on the right, the Accountant's on the left, and the Health Department at the rear, with a secondary entrance from Feethams. On the first floor of this block, approached from the principal staircase, which is placed centrally, are the council chamber, with Mayor's parlour and reception-room, towards Horsemarket, Surveyor's offices over the Health Department, and two committee rooms on the Feethams side. In the basement are placed plumbers' office, workshop, store room, and sample room, election and ballot room, workmen's pay office, weights and measures office, disinfectants' store-room, and kitchen. In the attic are placed the caretakers' apartments. Such is the general disposition; in detail, the plan of this block is well considered, the parts being excellently arranged for their separate uses. At first sight the lighting of the corridors may appear deficient, but careful examination shows that the lighting is sufficient though not superabundant.

Turning to the Public Hall plan, we find that Messrs. Clark & Moscrop score by making the net ground floor surface less than many of their competitors, the result of putting the corridors under the galleries and thus including them in the hall though separated from the auditorium by a 9-in. wall. With entrances on all four sides it is easy to give ample means of exit, but we notice that the authors have overlooked an important point in arranging safe exits for large bodies of people. The sum of the widths of doors from the ground floor of the hall is 40 ft., but the numbers who pass through these, as well as a large proportion of the occupants of the gallery, have afterwards to pass through doorways whose collective width is only 24 ft. It is bottle-neck planning of this kind which leads to disaster in times of panic. The stairs to the galleries would not pass the London County Council, and have, indeed, too many winders for perfect safety. These are blemishes in an otherwise exceptionally able plan, which, we trust, the authors will be able to rectify in carrying out their design. The external treatment is a free adaptation of English Renaissance, with reminiscences of Kirby Hall and of Mr. Norman Shaw; dignified, but by no means devoid of interest, picturesqueness, and concentration.

The whole design may be justly said to be worthy of becoming, next to the church, the chief architectural ornament of Darlington.

The second premiated design lacks the carriage entrance of the first, and has the two blocks connected, but otherwise is very similar in the arrangement of the ground-floor. On the first floor of the Municipal Offices there is, however, a vital difference; the council chamber is placed in a quiet and secluded position in the centre of the site, and has the waiting-room arranged as an ante-room. The Mayor's reception-room would, however, seem to produce a very unpleasant interior, lighted at one end and with lantern lights running the short way of the room. The planning of the public hall, with its approaches, is fairly satisfactory, though even here there are some objectionable features, such as steps in an unexpected and dimly-lighted position. Those of our readers who are acquainted with Mr. Cheers's published competition drawings would easily recognise his influence on the design, especially in the highly-coloured perspective, which we heard a lady visitor describe as "a lovely pretty sketch." The design is, of course, Renaissance; but there is a certain restlessness and striving for effect, which, combined with an apparent division of the design between the joint authors, rather causes the whole to be lacking in coherence.

Mr. G. Gordon Hoskins, the author of the third premiated design, has made a bold bid for victory by submitting two alternative designs, both excellent and well worked out and illustrated by admirable drawings. The vital point of difference between Mr. Hoskins' alternative designs is in the alignment of the Public Hall, Design No. 1 having the axis of this parallel to Houndgate and Design No. 2 at right-angles to the same and hence parallel, as in both the first and second premiated designs, to Feethams. The ground plan of the Municipal Offices is similar in general lines of arrangement in each design; an open court in the centre with corridors and staircase-hall surrounding it, the Town Clerk's, Borough Accountant's and Health Department in similar relative positions to those described in the first premiated design. In their first floor arrangements these alternative plans differ in the placing of the Council Chamber. Design No. 1 has the Council Chamber in a central position, design No. 2 at the angle of the Feethams and Horse Market elevations.

There can be no question that the disposition adopted in both designs is far more costly than that of the first premiated design, though, from its very high merit, the



plan has fairly deserved a premium. There is very little to choose between these diverse alignments of the Public Hall, as the plans are worked out by Mr. Hoskins, but the design No. 1 is in this particular somewhat preferable, being entirely free from the bottleneck defect, and with the very great advantage of exits from the balcony entirely distinct from those of the body of the hall. The exterior is dignified and free from ostentation, although we are scarcely prepared to entirely admire the design of the public hall either in its exterior treatment or in its interior, with its nineteenth-century hammerbeam and iron-tie roof, of a type more in vogue twenty years ago than it is to-day.

Our space will not permit us to notice the whole of the remaining eighty-one designs, of which a smaller portion than usual are the outcome of that youthful and vaulting ambition which produces the ludicrous efforts that are seen, more or less, in all open competitions.

Amongst the most noteworthy designs that have not succeeded in winning a premium we may mention that under motto "It Speaks for Itself." The plan is on good general lines, somewhat following those of the third premiated, but rather more modestly. Amongst the faults are the insignificance of the principal entrance, the planning of the principal stair, and of the Rates Office. The first-floor plan is very good, but some trouble and expense have been vainly applied to the formation of a connexion between the public hall and the official block. The council chamber is well placed in a quiet position, and the whole arrangement of the municipal offices is workable. The public hall is well treated in the main, with almost a sufficiency of exit. The exterior may be best described as Belcheresque and Flemish, picturesque, but not too much so. The author does not appear to have visited the site.

It was hardly to be expected that eighty-four designs should all bear different mottoes, and there are several instances of identity of choice. We see two "Rockets," two "Maltese Cross in Circle," two in "Suspense," two "Practical," and no less than three adopt the local motto, "Floreat Industria."

One of the "Rockets" has a plan which, with less ambition, would have been in many respects good, but makes, amongst other mistakes, the very great one of placing the platform of the Public Hall at the Houndgate end of the site, a solution which several competitors have adopted, but which fatally hampers the arrangement of exits.

"Red Griffin" has a very pleasant piece of design in his elevation to Horse Market, whilst that to Houndgate is inoffensive, and that to Feethams somewhat monotonous. The plan, however, is weak, the Town Clerk's department disjointed, the Accountant's scattered. The Public Hall has the platform at the wrong end, and the exits unsatisfactory, though less so than this disposition has sometimes led to.

The design by Mr. J. P. Pritchett, of Darlington (Black Cross in circle), has a good plan in ground floor of Municipal Offices, though the Rates Office might be improved. The first floor plan is not of equal merit, the Council Chamber being, for example, at the corner of Feethams and Horse Market, which leads the author into difficulties with the separation of entrances for the councillors and the public. The elevations are cold and formal, without being correct, and fall far below any of the premiated designs.

"Excelsior" has a plan well arranged as regards the municipal offices both on ground-floor and first-floor, but the public hall, which is planned to hold 2,021, is defective in exits for that number. The elevations are of the *fin de siècle* municipal type with which we are now familiar, picturesquely composed, but not calculated to excite much enthusiasm in æsthetic circles.

A near neighbour to the last is "Renaissance," which is in the newest neo-Renaissance, with the circular portico now quite the mode. The perspective shows in pleasant colour the acme of the designer's efforts, at

the corner of Horse Market and Feethams, from which the conception gradually tapers off in a quiet but not altogether unpleasing fashion. If only the neo-Renaissances could give us a ground-floor *without* abnormally squat semi-circular openings, we should take more delight in their evidence of study of English work of the eighteenth century. The plan is in the main good, though the author appears to have very great faith in the travelling power of light through his corridors.

"N," in circle, has a plan which has many merits, both in the ground floor and first floor arrangement of the municipal offices, and the elevations are entitled to a high place as a suitable, dignified, and withal sufficiently piquant treatment of the mulioned window type of English Renaissance. The public hall has its platform at the wrong end, and, in spite of the author's very creditable efforts, the exits are not satisfactory.

"Toujours Prêt" sends a plan laid out on good lines, but in detail lacking that intimate acquaintance with the working of the various departments which is essential to a perfect plan. The exterior is a respectable attempt at the neo-Renaissance, but with that insufficient knowledge which exaggerates mannerisms.

"R" is one of those designs which help to maintain the high average of the competition, but is not quite good enough to win, the details of the plan being not quite right, notably in the accountant's department, while the public hall again has the platform at the wrong end.

"Utility" is another able design to which the observations just made on that of "R" are also exactly applicable. The elevations, though a little wild, show ability, and, like those of "R," may fairly be placed amongst the first rank.

"Omen" is yet another design of similar calibre, with the further merit of a very well conceived exterior, in which respect there are few that are its equal. An excellent perspective by a readily-recognised and well-known draughtsman does full justice to the merits of the design.

"North" takes a good position with an able plan, albeit somewhat extravagant in the matter of staircase hall. The platform of the public hall is again at wrong end. The external treatment is of excellent quality, and shown in a good coloured perspective. Like all the designs which have the public hall platform at the wrong end, the elevation to Houndgate is haphazard and ragged. Houndgate is a back street, but is not bad enough for the treatment many of the competitors have bestowed upon it.

Another design of the neo-Renaissance school is marked with "Black Cross in Circle," and, allowing the mannerisms, has some charming bits of design, especially, of course, those shown in the perspective sketches, very piquantly executed in pencil grey. The plan is far inferior to the elevations, and contains many faults, including the platform at the wrong end.

"A. M. S." has a dignified and well-studied exterior of high merit. The plan is also well studied, but has several vital defects, as the position of council chamber at the angle of the site, whilst the exits from the public hall are totally inadequate for 1,600 people.

"Three Wafers in Triangle" is an ambitious design with many commendable points, save for a tendency to extravagance both in plan and elevation.

Many designs that we have no space even to mention have points of merit either in their arrangement or their external treatment, but it is clear that a very large number of competitors have heavily handicapped themselves by not visiting the site before spending time and money, talent and hard work, and have thus, for want of a simple precaution, wasted their labour.

CHURCH OF ST. JOHN AT DAMASCUS.—An article on this subject by Mr. Lethaby, which was announced for publication, we have been obliged to hold over at the last moment for want of space.

## THE MOSAIC WORK AT ST. PAUL'S.

**T**HE mosaic decoration of the choir of St. Paul's, which has been in progress for three years past from the designs and under the superintendence of Mr. W. B. Richmond, has now reached a point at which some idea may be formed of the character and effect of the work as a whole, so far at least as it can be judged from the near point of view of the scaffolding. The work now done includes in the first place the three spaces in the semi-dome of the apse, in which have been placed a colossal figure of Christ in glory in the centre, with groups of recording angels of good and bad deeds respectively in the side spaces. On the "attic" piers below the roof ribs of the apse, and below the two transverse ribs immediately adjoining the apse, are figures of moral virtues—Charity, Hope, Fortitude, Chastity, Truth, and Justice. In the wall-spaces of the eastern bay of the choir two long panels on each side are filled with a design of the Sea giving up its dead, and below these the blessing of Abraham by Melchisedec on one side and the Sacrifice of Noah on the other side. The easternmost of the domical compartments of the roof is decorated with an elaborate symbolical representation of the creation of birds, *i.e.*, one of the Days of Creation. As far as the meaning of the scheme of illustration is concerned this seems somewhat disconnected, though it may all fall into its place when the whole scheme is completed. At the time of Mr. Richmond's lecture on the subject at the Arts and Crafts-Exhibition we referred to some of the views which he expressed in regard to mosaic; the preference for the execution of the mosaic directly on the wall instead of the modern plan of execution on paper and the transference of the work *en masse* from the paper to the wall; the concentric treatment of domical spaces; and the principle that multiplicity of detail was by no means to be feared, but was rather an aid to the decorative effect of the work. This last was the only one of Mr. Richmond's maxims which we felt inclined to traverse. Multiplicity of detail may help the effect of the work in a merely decorative sense, but it is a question whether much of this small detail will be seen from below; its effect will be apparent, no doubt, but its meaning will not be clear, and it may be questioned whether the decorative effect would not be as well attained by breaking up the smaller surfaces with different tones of colour, or with diapers which there is no need for the eye to be able to make out or follow precisely. The concentric circle treatment of the domical portion of the ceiling we entirely concur in. The treatment of the pendentives of this dome, with figures of angels conventionally designed, and with outstretched arms filling the expansion of the upper portion of the spandrel, and appearing to support the ring of the dome, is one of the best things in the design, and one which is certain to look well from below. The compositions on either side of the clear-story windows below the domical compartment of the ceiling will be among the finest and most effective portions of the design. Those on the north side, the Persian and Delphic Sybils, we had the pleasure of illustrating in the *Builder* for November 11 of last year. The figure of Solomon, which faces the Delphic Sybil on the south side, is also a fine one. It will be observed that the outline of the scrolls at the base of the windows furnishes a kind of architectural suggestion for the composition of these seated figures, which appear as if partially supported by the scrolls. The scrolls have been decorated with a square-toothed gold edging on a red ground, which brings out their lines and gives them a sparkle assimilating them to the adjoining mosaic work. The system of executing the mosaic directly on the wall has certainly vindicated itself by the result; the work has much more life of surface than it could have if transferred mechanically from paper, and the system of setting the cubes at



regular angles, instead of in one plane, gives remarkable effect of richness and flashing, even when seen close to the eye from the scaffolding; and the difference will probably be even more marked when seen from below; we shall have a rich-looking surface of texture instead of a flat effect of colour. The windows in the apse, designed to harmonise with the mosaic, are very fine in flour, and in what may be called the flame-effect of the design. Those in the east story entirely bear out in execution the plan we formed of them from the drawings at the Arts and Crafts Exhibition; they are sufficiently in harmony with the Renaissance building without displaying the coldness and want of true "glazing" effect which is characteristic of the usual type of Renaissance stained glass.

It will be a matter of great interest to see that the effect will be from below when the affording is removed. It is at all events a great pleasure to see that something is being done in earnest at last, and it is to be hoped that funds will be forthcoming for the continuation of the work straight on. The portion now executed has cost 12,000*l.*—certainly not an exorbitant sum. It is being tried out by Messrs. Powell.

## NOTES.

THE appointment of Royal Commissioners has somewhat become in the hands of politicians a means of appearing to do something in regard to a particular subject, and at the same time of postponing any real action for an indefinite period. The appointment of a Royal Commission inquire into the subject of Secondary Education is an exception to this practice. It is impossible to formulate a scheme for a general system of secondary education throughout England without a preliminary inquiry. The importance of such a system has long been known to careful observers; it was the main object of the late Matthew Arnold's official life, and it may be now said to be at last within reach. To a large extent there can be no satisfactory system of technical education without a proper system of secondary education. A good deal of the so-called technical teaching given by the County Councils is really a part of the national Secondary Education. In the grammar schools which are scattered over England we already have the nucleus for a national system of what perhaps should more properly be termed intermediate education—that is to say, education for those who are between the great public schools and the elementary schools. The work of the bricklayer and the carpenter can secure a sound elementary education; on the other hand the son of a public school, or the son of a house-owner is sent to a public school, where he obtains a fair classical or modern education. The report of what will hereafter be known as Mr. Bryce's Commission will be awaited with anxiety and interest, and we trust that no time will be lost in the necessary investigations.

THE programme for an increase of the force of the Fire Brigade put before the County Council on Tuesday, is a step in the right direction, though by no means so good as many believe, and, of course, doing nothing whatever to do with fire prevention proper. It is actually proposed that London should have some five years hence, *i.e.*, in 1898, a Fire Brigade of not 970 strong, a number exceeding by 40 the figure (931) Sir Eyre Massey thought necessary for this city as far back as 1872, and in this manner can quite reasonably expect to have the equipment which would be an adequate one for present requirements somewhere in the third decade of the next century. The present addition to the Brigade in men, large as it is, but slightly increases the force avail-

able for actual service at great conflagrations, where it is necessary to have a large body on the spot. Two large fires, or even three, like those of July 18 (St. Mary Axe, Brompton-road, and Whitechapel) will again find the Brigade an undermanned one, again the rest of London will be left unguarded for hours at a time, and, in spite of the wonderful physical exertions of those in attendance, we shall continue to read such disgraceful stories as are contained on pages 21 to 23 of the Brigade's annual report for 1893. The additional men and appliances we are to receive simply give the Brigade greater facilities for having a few of their men at the first stage of a fire; and this increase of efficiency is certainly a boon both for the household and the firemen. The main body of the County Council, however, apparently do not think this extra efficiency worth the money, and have referred back the proposals to their committee. Destruction by fire always means a national loss, and this should be prevented. Insurance, practically a tax, may protect the individual from a heavy loss, but does not prevent the national loss. We hope the Council will look at it in this light, even though there may be an extra farthing to pay; but with the increase of London's safety it is also the duty of the insurance offices to lower their rates and thus lessen the burden of this extra farthing.

AT a recent meeting of the Académie des Inscriptions et Belles Lettres Mr. H. Weil spoke on the recently discovered metrical inscriptions at Delphi. Information about these is so hard to get that all scraps are welcome. One inscription consists of a Pæan, and is complete. It is likely to be valuable to mythologists as embodying a new feature in the Delphian legend of Apollo. It is preceded by an honorary decree to the writer of the Pæan. The two fragments, accompanied by musical notes and running in all to thirty-seven lines, seem to belong to the same hymn, and present a vivid picture of a Delphic festival. As they contain an allusion to the invasion of the Gauls, it is probable the hymn was written soon after 278 B.C. Fragments only of a hymn written 200 years later have been discovered.

ACCORDING to the latest list of the reports submitted to the German Government by its technical attachés, Great Britain apparently no longer enjoys any regular criticism of its public works at the hands of the Emperor's special emissaries. The countries thus honoured are Russia, Austria, France, Italy, the Netherlands, and the United States, and, with the exception of the representative at Rome, the attachés at their respective capitals seem to have most diligently contributed to the Berlin Archives. Most of the reports treat of works of civil engineering, excepting in the case of those sent from Washington and Paris, which contain much information for the architect. The representatives at these two cities have described a number of interesting buildings and works, illustrating them with drawings or photographs; and our German *confrère* is quite to be envied for the facilities for study thus afforded him.

THERE is now little doubt that the Tower Bridge will be opened to the public some time next June. During the last six months Sir William Arrol & Co. have made great progress with the erection of the steel-work, and the large moving leaves are now completely built. These leaves, each of which weighs some 1,400 tons, will be lowered and raised for the first time since their completion, within the next two or three weeks, the hydraulic machinery on the piers required for this purpose being practically finished. The steelwork forming the side spans of the bridge is all in place, and the roadway is now being formed over this portion of the structure.

PERHAPS a worse case of an insanitary bakehouse has never been heard of than that which came before Mr. Bushby, the magistrate of Worship-street Police-court, a few days ago. A baker was summoned by the Sanitary Inspector of Whitechapel parish for permitting a nuisance to exist in his bakehouse, and the facts, as given in evidence by Mr. Harvey, the Inspector, are briefly as follows:—

"Witness visited the premises on February 27, and inspected the bakehouse. He found a water-closet divided from the bakehouse by a rough partition, the approach to the place being by a dark passage with wooden walls. All along the passage, and percolating through the wooden sides into the bakehouse, sewage matter was flowing inches deep. At one side of the bakehouse was the trough for mixing the dough. It was within a few inches of the water-closet, and the wet from that place had soaked under the trough for all the length. The sleeping room behind the shop, occupied by the defendant and his wife, was over the passage, which was flooded with sewage. The water-closet was choked. There were forty-eight people living or working in the house, seventeen of them being children. A notice was served on the defendant to do away with the nuisance, and two days later the place was visited again. The defendant was then in bed, but a man and a boy were making tarts in the bakehouse, bread being made and baked at night, the trough mentioned being used. Nothing had been done, and a summons was at once applied for."

We should think so! But, as the defendant had occupied the premises for three months, it seems incredible that the evil conditions had not already manifested themselves in various ways, and, as the magistrate remarked, "that the defendant was alive to tell the tale." Moreover, presuming that the nuisance is an old-standing one, how is it that the Sanitary Inspector had not previously taken action? Of course the magistrate made an order to close the place forthwith.

THE subject of window-cleaning accidents is drawing more attention than usual to the contrivance of windows with reversible sashes, and the "National Safety Window Co." bring before us a model of a window which has, we understand, been scheduled by the Corporation authorities in Glasgow, where it is much in use, though not much known in the South at present. It is certainly one of the most simple and convenient in working that we have seen. The sashes, with the usual cords and weights, are also hinged on a large brass rod running the whole height of the left-hand side of the window, the hinge being in tube form so as to slide on the rod. The inside bead does not project beyond or cover the edge of the sash, but a metal tongue, somewhat like a "parting slip," is let into a groove in the vertical rail of the sash. This metal slip is made so that it can be moved back out of the sash groove, and rendered flush with the frame, by a brass handle working in a slot in the lower part of the frame. A single turn of this handle also, screw fashion, holds the metal slip tight in position, either in or out of the sash groove. The upper sash has a similar groove and metal slip, the slip in this case being a fixture, but the sash has only to be slid down to the lower part of the window-frame to pass the metal slip, which is fixed only in the upper part of the frame, and turn inwards like the lower sash. The want of the projection of the inner bead, as a protection from draught, may be objected to, but the metal slip is probably as effective in this way; and, as far as one can judge from the working of a small model, there seems really hardly any other criticism to make on this window. The name of the inventor is Mr. F. M. Houghton.

THE Charity Commissioners have framed a scheme whereby Homerton College, otherwise called the Training Institution of the Congregationalist Board of Education, will remove to the buildings of Cavendish College, Cambridge. It is proposed that the Board shall accept a five years' lease, at an annual rent of 680*l.*, of the property, including ten acres of land, at Cambridge, with an



option of purchase for 17,000*l.*; and, in that event, that Homerton College and its site shall be sold. The College was founded about one hundred years ago, and claims to be the oldest foundation of its kind in London. It originated in some meetings, begun in 1730, held at the King's Head, Sweeting's-alley, whence it derived its early name of the "King's Head Society." Having for a while been domiciled in Plasterers' Hall, and subsequently at a house in Mile End-road, opposite the present People's Palace, 1754-69, the society leased premises on the south side of High-street, Homerton. They pulled down that house in 1823, converted its site into a garden, and built a new college in the rear. The architect was Samuel Robinson; his design, since slightly modified by an addition, being of a very simple character, consisting of two floors above ground, with a main elevation of a central pediment supported by six pilasters, between two narrow wings. Cavendish College, to which the late Duke of Devonshire munificently subscribed, was opened by him in 1876, having been established upon a proprietary basis by the County College Association. It was subsequently incorporated under the Companies' Acts, and closed in 1892. In 1888 Messrs. John Giles, Gough, & Trollope's designs, and Messrs. Claridge & Bloxam's (of Banbury) contract—6,090*l.*—for a central hall and offices were accepted.

THE fire that broke out at Elton Hall, Huntingdonshire, threatened at one time to consume the whole mansion, but fortunately the efforts of the Oundle brigade, aided by appliances on the spot, prevailed. The greater part of the library, however, was destroyed, and the damage has been estimated at many thousand pounds. Elton stands near the high road from Oundle to Peterborough; its park, lying in the Nene Valley, extends on the south into Northamptonshire. Elton, or Aylton, had for long been a seat of the Shapcote family, one of whom, Sir Thomas, is commemorated by an inscribed stone (1470) in the parish church. A private chapel, built in 1490 by the Lady Elizabeth Dinham, and cited by Camden, was incorporated in the new mansion which Sir Thomas Proby, Bart., built, *circa* 1663, in the castellated style. His descendant, John, second Baron Carysfort, in the peerage of Ireland, was advanced to an earldom in 1789. In the church, restored seven years ago by Lord Carysfort, are monuments of the Probys. In April, 1843, Dr. Faber, Superior of the Brompton Oratory, being then Fellow of University College, Oxford, was presented to the living of Elton, where he remained until November, 1845.

A FINE piece of wrought-iron screen-work, designed by Mr. Pearson as a side-screen for the choir of Peterborough Cathedral, has been on view at the makers', Messrs. White & Sons, of Oxford-street, during the last few days. The screen is treated very simply, with upright parallel bars filled in with rich scroll work in the lower portion up to about the level of the eye, and with narrower band of similar work along the top. The scroll work is simple in detail but designed in the true spirit of Medieval wrought-iron work, and is very effective *en masse*.

INTERCEPTING TRAPS.—The Hornsey Local Board have passed a resolution by nine votes to six in favour of abolishing the intercepting trap, and have asked the Local Government Board to allow them to expunge the by-law making the provision of the trap compulsory. The Board have done this, notwithstanding that their Surveyor, Mr. T. de Courcy Meade, had presented a most voluminous report, in which he gave a list of many places where the trap was compulsory, and also the opinions of many municipal engineers in favour of the trap.

LIFTS, BALMORAL, &c.—We are informed that lifts have been erected at Balmoral, Osborne House, Windsor Castle, and Buckingham Palace, for the use of the Queen, and that Messrs. R. Waygood & Co., of London, carried out the work.

## THE ADVANCEMENT OF ARCHITECTURE.

ROYAL ACADEMY OF ARTS.—LECTURE VI.  
AITCHISON, A.R.A.—LECTURE VI.

I THINK I must say a few words on the masterpieces of that great genius of the seventeenth century, Baldassare Longhena (1602-82). If we admit as a hypothesis that the end of external architecture is to produce a striking, rich, and magnificent front, and to be regardless of structural propriety or refined taste, we must admit that Longhena produced works that most forcibly strike all visitors to Venice, and these works not only have the great merit of attracting attention, but of conveying the impression of the greatest grandeur and magnificence. The Pesaro Palace, and by some the Rezzonico too, which the poet Browning bought, are reputed to be by him; and though the details are certainly barocco, no one, whether he be an architect or an amateur, has gone down the Grand Canal for the first time without thinking that these two palaces have done more to impress him with the former wealth, magnificence, and splendour of Venice than all the rest of its architecture. Here, however, as elsewhere, architecture tells the tale of the condition of society. The Pesaro Palace is richer and more gorgeous than anything else, but the richness is rather overdone; the forms are neither so clear, so elegant, nor so well-proportioned as those of the earlier Renaissance palaces; the figures are inclined to sprawl, and there is the want of the stateliness and dignity of the Vendramin Palace, and the artistic invention and simplicity of the Spinelli.

The Pesaro Palace consists of a rusticated basement two stories high, surmounted by two other stories; the noble floor has fluted Ionic columns and an entablature, and the top story has fluted Corinthian columns; but though the architrave is of normal height, the frieze has been greatly deepened, and has cantilevers coming down to the architrave, one cantilever being over each column; thus the entablature forms a crowning feature, proportioned to the whole height of the palace. The front to the Grand Canal has seven windows; the three middle ones form a centre, by being flanked at each end by coupled columns. The windows are arched, and the reveals are so deep that the archivolt stands on imposts formed of the entablature of columns coupled in the thickness of the reveals, thus giving most striking evidence of the massiveness of the structure; the carved key-stones are brought out to support the architrave between the columns, while Cupids in every possible attitude fill up the spandrels, and thrust their legs or feet over the archivolt; the top story has balustrades between the pedestals, while the balustrade of the noble floor is continuous and covers the lower parts of the pedestals of the columns. The battered sea wall that rises above the Canal is capped by an ornamented string, a little above this a narrower string takes the trusses of the basement windows, and the two strings are connected by the grotesque heads of sea-monsters. Two tall arched openings form the entrances, with a niche between, and not only connect the two stories, but give an idea of the majestic height of the interior; while the rustications are cut into facets, which give a sparkling appearance to the whole basement.

The superposition of some sort of network over the main plane of a building not only gives variety, but there is generally such a difference of shape between the architectural objects of the two planes, that they make an agreeable contrast and enhance the value of one another. This device probably originated with the Romans, though there is a Greek example, and it has often been sought after by architects in advanced styles.

Late Gothic for example, as at Stralsund, only there the narrow arcades in front of windows are not very logical. Longhena's church of Sta. Maria della Salute is almost too well known to need further description; but whether we consider its plan or its perspective effects, each shows great power of composition. The plan itself consists of an octagon, followed by an oval transept, and that by an irregular oblong at the back. The outer octagon has external projecting frontispieces which form chapels within, with an aisle all round to serve them, leaving an inside octagon for the nave, which is crowned with a dome on a drum; the external dome, which is much higher than that of the inside, is of wood. Between the altar and the nave is the long oval transept, which gives great effect to the service at the altar, both from the space and the lighting, for this oval transept is well lit at each end by windows, which cannot be seen from the nave.

The centre of this transept is also crowned by a dome, and there are two elegant little bell-towers that start from either side of the altar. The towers of the towers are formed into open lanterns; each face of the lantern is crowned with a carved pediment; from the segmental roofs a drum and a dome spring, with a little lantern at the top, on which a cross stands. From whatever point of view the church may be looked at, these bell-towers and domes compose picturesquely. The buttresses to the drum of the large dome are formed into the shape of huge trusses with statuary on them; the idea of the buttresses is, rationally, supposed to have been got from the illustrations to the hyperbomachia of Polyphili. I fancy that the exterior of no other church in the world has been so often painted, which at least shows its popularity with artists and the public.

Before finishing the sketch of Renaissance architecture, I must say a few words about its development in France. In Italy many causes favoured its introduction; *i.e.*, its comparative simplicity, its proportions and its style; the prevalence of Roman buildings and remains; the absence of any great school of architecture; and the patriotic hope that by reverting to Roman architecture, Roman greatness would return to Italy. But only the first of these reasons could have had any weight in France, though there was the potent reason that it was fashionable. We, however, have been too apt to overlook the spread of humanistic lore, a taste for the antique, and the prevalence of Roman remains in the south of France; which San Gallo, Vignola, Palladio, and San Michele came to draw. The Maison Carrée and the other temple at Nîmes are illustrated in Palladio's works. In the fifteenth century two Italians, Francesco Laurana and Jerome of Fiesole, were brought over to France, and while the first erected the Chapel of St. Lazare in Marseilles Cathedral, the latter caused some of the pilasters on the tower of the Duke of Brittany, and the scrolls on the tomb of Charles VIII.'s children.\* France at the time of the evolution of the Renaissance, had an architecture that was complete, probably requiring greater knowledge and skill than any other in the world, and a school that dated from the fifth century. No greater problems in graphic geometry than the plans for elaborate stonemasonry can ever have existed. Such plans rival in complexity the patterns and stalactite work of the Saracens. The constructive knowledge of stone possessed by the Gothic architects has never been equalled, except perhaps by the knowledge of iron among the present engineers. Yet, with all this skill, all this knowledge, and with a population admiring this last and elaborate form of Gothic, the Renaissance so far overcame it as to force it to clothe its construction in Classical forms. The kings, the great nobles of France, and all those who formed or followed the invading armies, had seen the principal buildings of Italy; and though the French seem to have been most struck with the gardens of Italy, there still must have been suggestions in the new architecture as to force the acceptance of its principles. The Italian painter and sculpture was simply superior in knowledge, dignity, composition, and colour to that of France. The humanists had so familiarised the learned with Classic lore, and had raised such admiration for Classical work, that the use of Classic forms had become a sign of mankind being freed from asceticism, from the thralldom of the clergy, and from intellectual apathy. It has always been known that many of the famous Italian artists had visited France, mostly at the invitation of Francis I.—Serlio and Vignola, Benvenuto Cellini, Primaticcio, and his pupil Niccolò del Abate, Il Rosso and others, and these Italians were generally credited with having given this turn to French architecture. But it has been discovered that nearly all the architects of the Renaissance buildings in France were Frenchmen. A long list of Renaissance architects is given in M. Léon Palustré's admirable book on the Renaissance, although it is not yet known where or how these French architects picked up their classical knowledge, if there were Renaissance schools in France.

Probably the two most brilliant examples of early French Renaissance are the Castles of Chambord, by Pierre Nepveu, called Trinquet, and Francis I.'s wing of the Castle of Blois, by Charles VIart. These and many of the early Renaissance castles show a grafting of Classic details on a Gothic structure. Still, they show an affluence of invention, and strong national characteristics that entirely separate them from Italian examples. The familiarity shown with

\* Charles VIII. :—born 1470, reigned 1483, died 1498.  
Francis I. :—born 1494, reigned 1515, died 1547.



anciful carving of pilaster panels and pilaster capitals, taken by the Italian Renaissance architects from Roman work, is doubtless partly due to Italians who worked in France during the thirteenth century. The French Renaissance, though of Classic figures and ornament, shows a marked French character. This grafting, however, did not produce a new progressive style, but gradually led the way to a pure imitation of Roman work. It is curious to contrast the exuberant invention of the wing of Blois with the pedantic dullness of the wing by F. Mansart (1598-1666) built in 1717, but given the fashion of a close paraphrase Roman work, F. Mansart had style and needed dignity."

To revert to the Renaissance wing of Blois, though the front to the Court of Honour is by the most striking, and the staircase never fails to attract the attention of those who visit it, yet the side towards St. Vincent-square, though so striking, is the best piece of early French Renaissance. I have spoken of it in my lectures; but I have never seen it described with eloquence as by Mr. Van Brunt in his *Architectural Essays* of 1893, that he calls "Greek lines." In speaking of this front he writes: "It is sufficient to say here that these theories of treatment do not result in an effect of needless picturesqueness. The composition is essentially an expression of unity of the highest order. Its variety does not interfere with, but rather enhances this expression. If it is not only an academically classic, if the eye cannot detect by careful study a mathematical division of parts, with a regular and studied recurrence and recurrence, to bind the whole into a formal and ceremonious harmony, the best of such harmony is here completely produced. Its royal dignity and strength, its noble and its professional movement from end to end, present an architectural pageant, unaffected, and imposing, such as no conditions of contrast elsewhere in the world, at any other epoch, or in the progress of mankind, has been able to produce. It is another expression of the grandeur of the Christian world from the bonds of feudalism, and its happy entrance into the era of modern civilisation. It is co-existent with the establishment of new colleges, the formation of new libraries, and the increase in the number of books."

It is a reform which did not destroy the old, but for the sake of the new; but which adapted and amalgamated them with apparently conscious ingenuity, but with the instinct of the artist spirit. To laboriously imitate this variety, converted into beautiful unity by its limitation to a noble architectural motif, would be an affectation which would inevitably ruin its author."

A column came to be worshipped in France and been elsewhere.

When the Renaissance architects a Roman temple took the place of the "beautiful nude" of the sculptors and painters that we see in the work of Vasari, only there was much reason for the admiration. The beautiful figure is Nature's highest organism, and rises to an infinity of thoughts, physical, intellectual, and imaginative, while a column at most is only an example of a bearing, successfully turned into an architectural member. Something more may be said of the column which was originally the ornamenting of a wall, and may still be properly used in the place, where an inside wall abuts on the outside wall. This idolatry of the column may be seen at the little castle of Chantilly, the work of Bullant, where columns not only run through the roof, but the windows of the upper part forming dormers in the roof, thus giving the columns apparently no use as supporting members, as each column only carries a piece of entablature, thus giving a curious appearance to the whole front.

The French Renaissance progressed, the influence of sculpture in buildings ceased, and architecture came to monopolise nearly the whole as well as to be a more and more pedantic imitation of Roman work. M. Léon Palustré has a very admirable passage on this subject: "Grace, the suppleness, the spirit, the delicacy, the tenderness, in spite of their frequent imperfections, are the qualities of the Gothic architecture and that is the first half-century of the Renaissance so far as we are treated like those qualities one can see with, or as defects to avoid. The French architect too strongly penetrated with his own

merit, and not wishing to share with anyone the glory of creating a remarkable work, too often leaves so small a space to the sculptor, that he cannot be tempted to interfere in the general arrangement, just as we see at Rome from the time of Bramante."

The short account I have given of the Renaissance may seem rather like a story without a moral; but beyond what I have said already, the subject of the Renaissance would require many lectures to see if its defects could be cured without losing its spirit and beauty. I very much fear it would end like Hawthorne's story of the physiologist's beautiful wife who had a spot on her face, which he at last removed, but it killed her.

I must say a few words on the devices used to turn the prose of building into the poetry of architecture, but before doing so I must speak of the difference between two of the historic styles and the rest which, I think divide architecture into two camps, I mean Gothic and Moorish as distinguished in kind from Greek, Roman, Byzantine, the Saracenic of Asia, Romanesque and the Italian and later French Renaissance. Figure and landscape painting belong as much to one art as Greek and Gothic, and I must ask you to imagine each of these branches of painting as a beautiful nude figure; you cannot well compare a beautiful nude figure, or even a composition of wood, and by that I mean trees without leaves; you have endless patterns in the last case, not only made by the crossing of twigs and branches in one plane of trees, but the patterns formed by innumerable planes; in the figure groups there is a clearness and distinctness from which general laws can be deduced; but the other seems not only too complex, but to raise such different emotions that if laws can be deduced from the phenomena, they must be wholly different from the former laws. In architecture, all but the two excepted styles produce clear and distinct ideas, from which observation may deduce laws, and to these I will at first devote myself.

I think that a look of stability, if it be not a law, must precede laws, for without this our thoughts are otherwise engaged than in admiring the building. Next, size is one of the great elements of grandeur and impressiveness, for even a vast wall of immense height is certainly very impressive—the back wall of the theatre at Orange is a good example. We may enhance this by various devices, such as a small opening or two of a window size, i.e., out of which a man can put his head, by a parapet on machicolations, for the machicolations, by their recurrence and by their shadows, enforce on our mind the greatness of the wall.

The next is proportion, and all we can say of it is that some ratios are more agreeable to the eye than others, and some have an almost divine beauty. If we have a well-proportioned front or flank, simple repetition is perhaps the most important law of effect, but this effect may be heightened by slight variations in the similarity: this is the plan pursued by Nature in her vegetable creations. In architecture we see this law carried out by the outsides of Greek temples, occasionally in Gothic, as in the front of Lincoln Cathedral, and in the early Renaissance palaces of Italy.

Variety is the next important law, of which the simplest form is alternation. We see, for instance, at the Rucellai Palace, practically equal divisions of width by pilasters, while at the Cancellaria the widths of the spaces, divided off by the pilasters, alternate. In the same way, contrast is an extreme case of variety, and may be well exemplified by straight lines, squares, or oblongs alternating with circles; the best Doric of Greece is a fine instance of this, the square abacus contrasting with the round echinus, and the straight edges of the flutes contrasting with the circles of the annulets; and the Doric contains another law—that of the echo: the annulets echo the larger circle of the top of the echinus, shown against the soffit of the abacus. In Renaissance work you often see an arched opening contrasted with vertical and horizontal lines, and then echoed by a segmental pediment. Slight variation in the larger forms that follow one another is often most successfully used—for example, the circle coming from the octagon, or *vice versa*. Grace and elegance are very complex qualities made up of many laws, including roughness and smoothness. Roughness in good architecture is mostly produced by sculpture and mouldings, and is contrasted with plain surfaces. Perhaps there is nothing more elegant in Italian Renaissance than the doorway of the Confraternity of St. Mark's, where the

carved capitals and lower parts of the columns are contrasted with the smooth shafts. In composition, to take it on a large scale, there is the front and the sky-line composition. To speak of the first, almost all the Venetian Renaissance palaces and most of the churches have a centre and two sides. The noble composition of San Zaccaria is very striking, and it might be worth the while of some of the advanced students to try how this front would look if the two upper orders were turned into one, and the quadrant cornices of the aisles were stopped against the centre. One of the most charming sky-line compositions is that of St. Maria della Salute. The front of the Certosa at Pavia is badly composed, though some parts are beautiful; a great deal of it consists of odds and ends not properly tied together, and most of the proportions are not quite right; to paraphrase this and improve it, would be another capital exercise. Although no one can be taught to compose well by rule, he can be taught to avoid gross faults, and to be somewhat of a competent critic of his own work.

However, all architects and all connoisseurs are aware that slightly different proportions are often all that separate distinguished from commonplace architecture. We cannot surpass the Early Renaissance architects; we have not got their splendid vigour of mind and body, their enthusiasm, their culture in respect to beauty, nor their skill. We cannot go back to the aesthetic barbarism of Gothic, because we have seen better things—or, at any rate, things that appeal more to our present cultivation and state of mind.

We have not the constitutions of the Gothic men, nor can we soar to their ecstasies of devotion, revel with them in mysticism, nor even sink to their depths. In looking at the triumphs of Gothic art, one is always reminded of that Crusader who, to save his soul, left everything at home and braved unheard-of dangers to free the Holy Sepulchre from the infidels, but during a siege in the Holy Land killed and ate his wife and daughter. Spires rear their heads to the height of the Great Pyramid; massive-looking towers rise up in pinnacles; grandeur from arches borne by slight piers of stupendous height; galleries that look like lace, fringe the tops of cathedral fronts; gigantic gables filled in with stonework, surpassing ironwork in its slowness, and the cobweb in intricacy, cast floods of light into naves, of a length that the eye cannot fathom. Every part of these vast structures overflows with the signs of energy and invention. We are carried away into a mystic dream.

We ask if such things can have been done by man, and, if so, what sort of men can have imagined such feats of skill and daring. It is a rare case when we grasp the building as a whole, and we are no more shocked by want of propriety, by want of grace, by want of proportion, than we are in a stalactite cave, or by the forms assumed in a stormy ocean. We can only contemplate the architects with awe and astonishment, and ask if men will ever again do such things. Even in secular work, the outside of the staircase of honour at Chateaudun is full of grandeur and mystery as far as it can be judged from an etching. Although Moorish work is in some parts as complex, there was in the days of the Moors none of the fiery impulse or heavenly visions that animated the early Moslem savages, only these savages had no arts, and no fine arts but poetry. Moorish is wonderful in its stalactite and pierced work, but most of its forms mark a decaying civilisation.

We cannot have the ichthyosaurus nor the plesiosaurus now: if one were to be created it would die here, for the conditions for its living do not exist. We can have an artificial one at a pantomime with a man behind the scenes to pull a string and make the wings flap. It is the same with architecture: you may have pantomime Greek, or Gothic, or Renaissance, but the difference between the real and imitation architecture is that between a live animal and one preserved in spirits; there is the animal in both cases, and the only difference between them is that one is alive and the other is dead. We do not want an ichthyosaurus, a mastodon, or a sabre-toothed tiger, but some animal that is alive and beautiful to look on, useful, or even terrible. We cannot give genius, we cannot make people care for an art that gives them no pleasure; all we can do is to learn the art of expressing ourselves and the methods by which emotions were raised in former times, and when we have learned these arts, try to please ourselves and hope others will be pleased by our efforts; if not now, in future

A photograph of this wing of Mansart's I owe to the kindness of M. Chas. Lucas, and to M. Miessement, the architect of the French historic monuments.



generations; but above all things let us be sure we have done all in our power, and also let us take as models the former masterpieces that appeal to our sense, intelligence, taste, and cultivation. We can at least be sure of one thing about our buildings, *i.e.*, whether they will harmonise with the best sculpture and painting of the day, for if they will not, we may be sure we are in the wrong track.

The subject of these lectures is by no means new. In fact I may say that every architect who is now alive, and every architect who was alive when I was young, was anxious to advance architecture; and all that I have done is to roughly show how some novelty may be introduced and some improvement may be made. Joseph Louis Duc left a prize for an architectural design in a new style; and our old and esteemed friend César Daly was so anxious to see architecture again progress organically, that he not only published a pamphlet on the higher studies of architecture, and sent round a copy to the bulk of the profession, but personally begged the co-operation, in this important matter, of the architects he knew in England and America. One subject that he considered of great importance in these higher studies was symbolism; though I fear we are in an anti-symbolic age. One of his favourite schemes for starting a new development in architecture was an analysis of the causes that produced admiration for the buildings of the past, the investigation of those things that produced what is called a style of architecture, and the question as to whether there were analogous circumstances for the creation of a modern style. He said, too, no architectural society has asked itself what is the cause of the present disorder of architecture, and sought a cure; and he asks whether those common principles that architects practise in different styles adopt cannot be harmonised. He says the English eclectics of the Gothic school have at least shown an inkling of the necessity for modifying an historic style, to meet the knowledge, the science, the industry, and the habits of the day. The Gothic architects of France ought, at least, to expound the effect of the original Gothic on the æsthetic culture of mankind; and they should, besides preserving ancient monuments, associate themselves with architectural progress. He asks, too, some questions—*e.g.*, What is the influence of the general habit of travelling on the aspect of modern buildings? and how can we use in architecture the ingenuity, the invention, the knowledge, and the skill, both technical and æsthetic, of living architects?

We cannot help showing regret and emotion at the loss of this great man, who, when he came over to receive the Queen's Gold Medal, not only delighted every architect, but so many others in England, from Her Majesty the Queen to the humblest amateur, by his lucid descriptions of what architecture was, had accomplished, and might accomplish. It was delightful to find the vigour of mind, the earnestness, and all the sanguine aspirations of youth, in a man who had already over-stepped the threshold of old age; for he still hoped to publish an exhaustive encyclopedia of architecture; the materials for which he had been collecting for forty years. England is particularly indebted to him for publishing Sir Charles Barry's Reform Club-house, for it does not show its gratitude to architects by publishing their works; there is no monograph of St. Paul's, and when the Committee of the Reform Club wanted to make some alterations, they had to send to Paris for M. César Daly's publication.

I look on M. César Daly's "High Studies in Architecture" as one of the most important and suggestive essays we have on the progress of architecture, all the more valuable because he had a regular academic education, and academic in France not only means a thorough education, but one to which a traditional bias is given by the masters. It was from traversing that bias, that Viollet-le-Duc was so unpopular among those students and professors, who were wedded to this academic tradition. He was in fact a heretic among the orthodox; a position that is hardly realised in England or America, although the battle of the styles was being very fiercely fought out over here in my younger days. Pugin, who thought that architectural salvation was only to be gained by copying Gothic, freely expressed his disgust with Professor Cockerell at the Royal Academy for not propagating his opinions.

"It is a perfect disgrace to the Royal Academy that its professor of architecture should be permitted to poison the minds of the students of that establishment by propagating his erroneous opinions of Christian architecture. The influence which his position naturally gives him over their

minds is doubtless considerable, and the effect of his instructions proportionately pernicious. Not content, however, with the disparagement of ancient excellence, which he introduces in his official lectures, he is *practically* carrying out his contempt of pointed design in both Universities, and in a manner that must cause anguish of soul to any men of Catholic mind and feeling."

Yet Professor Cockerell was right from the æsthetic side, as Greek is, as yet, the most perfectly beautiful architecture the world has seen, and is as superior to Gothic in that respect as Gothic is to Greek in constructive capacity and mystic suggestions.

All architects are as much indebted to America as to France, for calling their attention to the want of progress, and proposing a method for improvement, for nothing more valuable has been written on the subject than Mr. Leopold Eidlitz's book on "The Nature and Functions of Art, and more especially of Architecture."

As the few remarks I have made on the possible improvement and on a certain reasonable divergence in our architecture, from that of the past, are scattered; it may be well to call your attention to some of the points in which I think improvements can be most readily made. The first is, fitting the building as exactly as possible to its use. The next is to let the outside show the shape of the inside, and not to put the inside into a box. Then there is the much overlooked science of construction, without which a man, in my opinion, cannot call himself an architect; much less is there any chance of any great organic advance. Another point, though not new, has been, I think, put in a new light—*i.e.*, not using as ornaments out of place, those features that have a real function to perform. Every architect would admit that palpable follies were blots on any architectural design; but columns that are purely supporting members, have so long been used as mere architectural decorations, that they fail to excite repulsion or contempt. The other æsthetic points are these—the study of profiling, which has been wholly neglected, and should be again taken up in the proper way; that is to make the mouldings tell, with the greatest beauty, the story you want them to tell, in this climate.

In architecture, which is to excite emotions things must look right; it is no excuse to say something answers its utilitarian end, unless it looks as if it would do so too. The cavetto and the cyma recta are crowning members, the ovolo and ogee are supporting members; to get variety and contrast, the crowning members are sometimes used to support, and they always look as if their noses would break off with the weight. If the Greeks, Vignola, or Palladio made this blunder we should avoid their fault. There is a cyma recta in the bed-mould of the Choric Monument of Lysikrates. The same is true in bases; the Greeks made the fillets of their skotias project beyond the bearing of the torus, and thus solidly supported the torus, not to speak of the superior effect gained by this narrow member being in light instead of in shade. The Romans put the fillet under the centre of the circular torus, so the nose looks as if it would break off, and the shade of the lower part of the torus is not separated from the upper shadow of the skotia by a line of light. The early Gothic architects often put a hollow on the top of the first torus of the bases of their pillars. This hollow looks as if it were a channel for water or for oil, to prevent ants climbing up the columns. The Gothic architects copied it, without doubt, from some Greek example they had seen in Asia Minor.

Another point is the learning to proportion things so as to make them expressive of the duties they have to perform; and lastly to find out, if possible, what æsthetic expression is both proper to the building and meets our own taste. In the useful part of architecture we are limited and constrained by the utilitarian necessities, while in the æsthetic part we have to tell the story and to please ourselves in the manner of telling it, though every architect finds he himself is the hardest taskmaster he can serve. If we have had the severe training necessary to make us architects, and the natural genius to make us great ones, we shall eventually please the educated eyes of those who love and study the art.

De Quincey says the knowledge the man's genius creates, makes the knowledge by which he is to be criticised and corrected, possible. This reminds one of Newton's discovery of the law of gravitation. The late Professor de Morgan said "that when Newton published his 'Principia' there were not five people in Europe who could understand it; but now, intelligent young men of twenty, who have studied mathematics and the subject, are capable

of comprehending the proof." So the poet Wordsworth says "the poet creates the taste by which he is to be enjoyed." And now I have spoiled Wordsworth, it gives me an opportunity of enforcing my advice about paralyzing architectural masterpieces of former times. Wordsworth has been called the poet of Nature, and it might be thought that he trusted to Nature for his art; but he not only tells us that he translated, and, I presume, turned into verse twelve cantos of Ariosto, but that he had endeavoured to put into verse the sonnet Michelangelo—one of which, he said, gave me much trouble to do than a whole canto of Ariosto.

The continuance of any people as a nation depends on its fighting power and its virtue. When it has ceased to be a nation, or even independent country, what remains to tell of its former greatness? Nothing but the ruins of its buildings, with the sculpture, painting, and the mosaic that are enshrined in them. All the rest of its wealth, magnificence and glory have gone, and it is easier to "where are last year's snows" than to say we have become of them.

The place the nation held in the world, and state of its knowledge, skill, virtue, and emotion remain only in the words of its poets, writers, philosophers; in the works of its architects, sculptors, and painters, and in its written music. It therefore behoves the powerful and the rich to foster the fine arts, which alone speak forcibly all in the present, and can alone give immortality in the future.

We have only one national festival devoted to the admiration of one kind of beauty and excellence—the "Derby Day." Some of the power and the rich do devote many thousands a year to the promotion of beauty and excellence in horses, but great men and great artists are of more importance than horses, even if they were immortalised on the Panathenaic frieze. What is there of turning this festival into a celebration like the Olympic games? There men as well as beasts strove for prizes, and there even men's excellence was acknowledged. Herodotus in his history there, philosophers expounded their systems, and artists displayed their work. Patriotic as it is to improve the race of horses must also put in a plea for the race of men. Palladio might have trod mortal or laid to rest till his death, if he had not found Trissino to whom he taught and trained, just as our Vane had swept chimneys all his life if he had found a patron, to give him his schooling and architectural education. To train a promise had his risks, but even a horse may, after training, turn out to be no racer, but only fit to cab, an omnibus, or the plough. Let me say all the employers of architects that when they have well paid them, they still owe them a debt of gratitude, which it is the worst meanness withhold; to the public generally that no person should endeavour to comprehend so much of the merits of architecture, just as most persons understand something of the merits of poetry; and to thank God that I have got poets, architects, and other artists; I will show to posterity that this general will show not wholly base and worthless; and let me say to the architects, spare no labour no pains to acquire the elements of this tremendous profession, which can only be adequately represented by men of brilliant genius, great capacity, and untiring perseverance. When have a building to design, be animated by the thought that, however small it may be, it is capable of enshrining the highest and noblest aspirations, the greatest skill, and the most perfect workmanship, and that, if it does contain all these qualities, it will at least give delight to the cultivated, and that it may be the means of conferring some meed of immortality, not only to the place where it is built, but on England itself.

**PATENT INSPECTION EVE-COVERS.**—This invention of Messrs. Bugler & Co., of Putney, is intended to afford a cheap means of examination and clearing of drains where it is desired to avoid some of the cost of manholes and inspection chambers. It consists in taking a branch from the drain to the ground level, at such a curve as will admit of a cleaning brush being passed down, and covered by a metal cover surrounded on the underside by a projection fitting loosely into a groove filled with grease and clipped down tight by a turning clip. The metal frame which holds the lid has a dovetail joint in the socket of the pipe. The invention appears likely to be useful in situations where means of cleansing are desired and where an inspection chamber is not imperative.

\* Pugin's "Apology for the Revival of Christian Architecture." London, 41s. 1893.



# THE ARCHITECTURAL ASSOCIATION: COLOUR IN LONDON STREET ARCHITECTURE.

THE ordinary fortnightly meeting of this Association was held on the 2nd inst. in the meeting-room of the Royal Institute of British Architects, Conduit-street, Regent-street, the President, Mr. E. W. Mountford, in the chair.

The minutes of the previous meeting having been read and confirmed, the following gentlemen were elected members of the Association:—Messrs. F. B. Dunkerley, and H. L. Anderson. Mr. F. T. W. Goldsmith, Hon. secretary, announced the following donation to the library:—“Surveying and Surveying Instruments, 1894,” presented by the author, Mr. G. A. T. Middleton. On the motion of Mr. Bannister F. Fletcher, a vote of thanks was passed to the President for allowing the members over the Battersea Town-hall on the previous Saturday.

The President drew the attention of the members to a series of lectures on “Painting, Sculpture, and the Applied Arts,” by Mr. C. W. Hall, commencing on April 10, and expressed a hope that they would be largely attended. Mr. Goldsmith announced that, in accordance with the instructions received from the general body, a petition had been drafted by the Committee and presented to Parliament with reference to the London Streets and Buildings Bill of 1894, and it was suggested to the Committee that a public meeting should be called to discuss the matter, if possible, before the petition was presented. This would have to be done within ten days after the first reading of the Bill. No doubt members of Parliament were uncertain as to when a new Session would open, and if there was no try probably the meeting would be held before the petition was presented. Under any circumstances it had been determined to hold such a meeting, and it would be held at as early a date as possible.

Mr. S. B. Beale then read a paper on “Colour in London Street Architecture,” which was as follows:—

In introducing the subject of “Colour in London Street Architecture” for discussion this evening, I am aware of the initial difficulty of saying which shall be both new and original. I hope, however, to show some justification by emphasizing the importance of good colouring, by vividly noting some of the colour effects to be in building materials of long standing, and in (for I think the time has arrived when we may profitably do so) to review some of the colour effects produced by the use of one or two materials of modern introduction, with the object of discovering, if possible, how far the promises of twenty years ago have been fulfilled.

Colour, in architecture, appears to me to hold position in importance possibly second to composition, but certainly before detail. It is unsafe to say that colour is of second importance, for the composition of a front may be good, but bad colouring will ruin it. Also, a building ill massed and good in colour is successful, independently of its composition. The reason I place colour tentatively second to composition is in view of the case in which the massing and composition of a building are both good, then, neither colour nor anything else will ruin it.

Utility and artistic treatment in planning, composition, and detail, are now brought to a high state of perfection, while colour, the one factor that appeals to all, remains stationary and unimproved. In London it is a hundred years and its co-factors in good architecture, and will remain there so long as detail is treated as the more important of the two.

For more professional credit's sake it is important that our buildings should be invested with good colouring, but if a stronger argument needed to show the necessity, it lies in the effect of colour on the eyes, the dispositions, and the health of the citizens. Nine persons out of ten receive an impression from the architecture they pass in the street; sometimes it is the form, more frequently it is the colour that produces it. The first seen, colour is the last forgotten. There is not a cheerful city in point of architectural tints, and yet, in the main, it is what architects have made it. Evolved from indifference rather than from design. A sunless sky and a drab atmosphere may accomplish a great deal in depressing of human spirits; the effect, however, is small compared with the amount of work done by the dismal walls of architectural colour. The line of our thoroughfares in all directions. The atmospheric outlook is made the scapegoat when spirits are at zero, but it should be remembered

that a cloudy firmament, though, perhaps, poor in colour, is usually rich in form, while the colours in the handiwork of man frequently have nothing to mitigate them. In this age of hard work, close reading, and sedentary occupations, the contemplation of scenery, light, and colour is the recreation of the eye, and the walk along the street is the main opportunity for it. If, then, the field over which the eye wanders is nothing but blackness and gloom, the eyesight of millions must be deteriorated by the want of colour in their surroundings. We must all have felt the gentle cheerfulness that comes on beholding good harmonious colouring, and who can deny its powerful influence in producing the bright and open disposition of the countryman, dwelling in the midst of nature's colour wealth, or in fostering the hopeless despondency of the town man surrounded by eternal gloom?

Colour, too, affects the health in many ways. It is reported on good authority that medical men appreciate this fact, and in certain cases prescribe a scheme of colour decoration for the interior of their patients' rooms instead of physic for another interior. However this may be, it is certain that colour surroundings have very material physical effects on mankind.

The principles of good colouring are few and definite enough, but individual taste is dependent upon individual feeling and sentiment. White is perhaps the best and purest medium for architectural expression, but the surroundings essential to its existence are a sunny clime, a pure atmosphere, and brilliant patches of colour to give relief. These are accessories not known in London. White, as it is to be seen pleasantly weathered in masonry and plaster work on the Continent, does not and cannot exist as a medium for architectural expression in the materials now used in this metropolis. In name our colours range from white to grey, yellow to red, rising in the streets with total disregard to the harmony or contrast of adjoining premises. The effect, good or bad, is, however, of little moment at the time, for a grim spectre spreads its sooty mantle on all alike, reducing them to harmonious obscurity. Some of the reds proclaim their identity in the fitful gleams of sunshine, but the whites, greys, and yellows maintain a strict incognito after a few years' investiture. There is not a thoroughfare in the whole City of London, nor half a dozen in the Four-mile Radius that one would choose to walk down on account of the pleasure derived from the outing. In some of the materials the self-colour is bad to begin with, in others the colours are good but badly disposed; in many instances a visible coating of dust and soot obliterates the tints, but in the majority of cases the materials soaking up the grime have weathered black. Queen Victoria-street, in the City, and Victoria-street, Westminster, are fine fields for study in any of these effects. London's colour does not compare favourably with that of many Continental cities.

Anyone who saw the exhibition of Mr. Rimington's drawings of Spanish towns, for instance, after making due allowance for idealistic treatment, must agree that ours is a colourless city compared with the brightness of many on the Continent.

Having come to the conclusion, after long observation, that the colour of London street architecture is dismally bad, I will endeavour to differentiate between the cause of and the responsibility for the same.

The final cause is the work of many contributory factors, the chief of the offenders being that irrational demon, the town atmosphere, created by narrow thoroughfares and high buildings, but even these agents would have but little effect in obliterating colour were it not for the position of London in the sunless valley of the Thames. These, then, are the immediate agents acting on impressionable materials. So far it is just and right to say the climate and dreadful atmosphere are the causes of the gloom that surrounds us architecturally, but when we go a step further and find that the materials used by architects are particularly susceptible to these influences, and that architects know them to be so, we are perfectly well aware of all the drawbacks to the maintenance of good and cheerful colouring, then, I think, in continuing to use these materials, as a profession, we alone are responsible for the gloom in which the metropolis is wrapped from end to end.

Before attempting to inquire in what direction improvement may be looked for, it will be instructive to notice the evolution of colour in some materials under the effects of a town atmosphere.

Stock brickwork, beginning life in a suit of bright yellowish ochre, is lowered after a few

years by the solution of rain and soot on its surface to a brownish grey. A few more seasons eliminate the brown, producing a blackish grey in fair weather, slaty grey in a strong light, and absolute uncompromising black in shadow or wet weather. In such colours, Great George-street, Gower-street, Whitehall-place and other stock brick thoroughfares are rich. This work appears to have no weathering qualities whatever, the nature of the material not permitting them. Dust, rain and soot are soaked up uniformly over the surface—wind and other weathering agents making no variety in the tones. Of all the colours to be seen in London street architecture stock brickwork, in whatever aspect, produces the most hopeless and depressing, and there is only one merit that saves it from provoking all the anathemas of Ingoldsby's Lord Cardinal, and that merit is the possession of a powerful contrasting effect on any bit of colour that happens to be planted in its midst.

*Yellow Mains* in London appear to voluntarily shed their colour independently of the action of the atmosphere, the surface becoming even in favourable positions an ashy grey.

Of the many kinds of red brick in use there are really very few of an artistic tone. Great improvements are made from time to time in the manufacture and burning, but the truer the brick in shape, and the harder it is in texture, the duller and more lifeless the colour becomes. The Ellistown bricks, now largely used, possess several practical advantages, but in colour do not satisfy the critical eye. A nice piece of work has been executed in Farnham red bricks in the new Admiralty extension, a tender surface relief being produced by using haphazard bricks of slightly varying depth of colour tone. The aspect and position of this work promise well for weathered effect provided the rain washings from the contiguous stone do not play their usual tricks with the front. It must be admitted that the majority of brick buildings, when newly erected, are certainly bright, and, in many instances, good in colour. The red examples in Fleet-street by St. Dunstan's Church were brilliant when drawn a few months ago. Twelve months hence they will have sobered into respectability, and then, the gloomy epoch of Fleet-street, year by year adding one more fold of the dreary shroud, will finally wrap them into obscurity. The ideal tone for red brickwork is purely dependent upon individual taste, but I will express the opinion that given favourable conditions of site and aspect a front built of bricks with a virgin surface of colour approaching the lightness of tint possessed by rubbed work would produce a more pleasing effect than the heavy reds in general use.

Of all materials, red rubbed brickwork properly designed on an open site with a western aspect, is capable of showing the most beautiful weathered effects, but in few instances of its use has it been properly managed or are the conditions favourable. As to the management of the material, the use of limestone in cornices, copings, or projecting strings in conjunction with rubbed brickwork is disastrous, as, even with a good aspect, the effects produced are more striking than beautiful. A chemical, or, it may be, an electrical action is set up by the atmospheric impurities, washing from the freestone on to the rubbed brickwork, blackens it and forms a crust of disintegrated material. This crust then voluntarily peels off.

It is curious, however, to notice that rubbed brickwork immediately below a flush freestone band, except when contiguous to the ground line, is not damaged in the manner just described, but becomes nicely toned with age, tending to prove that even the contiguity of limestone is not prejudicial so long as wind and rain are allowed free action on the surface. The Alliance Assurance Office, at the corner of Pall Mall and St. James's-street, built in red brick, partly rubbed, and stone dressings, as would be expected from Mr. Norman Shaw, everything that could be wisest in mass, colour, and detail. The effect, after some years' exposure, is certainly very pleasing. In this instance the western front has become more enveloped in grime than the southern front. The incrustation of dirt on sheltered and recessed parts and on the ornamental frieze has seriously obliterated the original colour, while the overflow from the stone dressings of icicle-shaped pattern in a sooty lime medium are very unsightly on the red brick surface. A small portion of the fronts above the principal cornice, together with a few square feet on the angle turret where the elements have had full play, exhibit a charming effect, giving promise



of what might have been under other circumstances.

All brick treatments seem to require a good self-colour, to begin life in our streets with, for bricks do not weather after erection in the same manner as the separate blocks in a stone front may be expected to do. Aspect also appears to make much less difference to the coloured effect of brickwork than it does to stone.

Of the two varieties of Portland stone so much favoured in London, the white is with difficulty prevented from turning black, and the brown a tone only one degree less dreary. There are a few examples of nice delicate weathering in this material to be seen, the position usually being the exposed part of the return flanks of high buildings above the roofs of lower ones. The Criterion Restaurant exhibits a small specimen. This piece of masonry receiving the full force of the west wind and rain driving unobstructed from the direction of Piccadilly has assumed a very tender weathered effect, in spite of the closeness of a batch of smoky chimneys.

The west but not the south front of the Duke of Buccleuch's house in Whitehall Gardens is an instance of clean weathering in stone—the effect being due probably as much to the proximity of some large trees as to aspect and free exposure.

It is difficult to explain all the colour effects seen in London stonework. The whiteness of balustrades and attic stories, also the piebald effect on many columns, may be accounted for, but the causes of some other effects to be seen, it passes the wit of man to discover. For instance, in contrast to the pleasant appearance of the Duke of Buccleuch's west front stands the Board of Trade office, a few yards away, with the same aspect, but covered with a visible coating of coal-black grime which the difference in age does not account for. I cannot explain the weathered angle of the National Liberal Club, a comparatively new building.

Of the few coloured stones used in the metropolis Ham Hill has received some attention lately. As a contrast to other colours, the bright ochreish tint is a relief, and I look forward with interest to the time when the weathered effect of the New Travellers' Club may be examined. The position of this club is very favourable for the development of tender weathered tones, but yellow of any kind is at best not a permanent colour in building material.

Daly's Theatre in this stone is losing the coarseness that was apparent at first, but there is little hope that any colour whatever will be discernible after a few years of the atmosphere of Leicester-square.

Probably there are many Ham Hill stone fronts of longer existence than those mentioned, but it is not possible to recognise them in their present garb. I now turn to a stone which stands town environment admirably, and weathers to nice tones. Red Corsehill has been sparingly used in street fronts, considering the marked indifference it shows to the attacks of the sulphur-laden atmosphere. A very good example may be seen in the front of Messrs. Tooth's art gallery in the Haymarket by Messrs. Archer & Green. There are no accretions of grime on the work, each stone is marked by tender variations of tone, no unpleasant stains mar the general effect, and from all points of view this front of Corsehill is a pleasing bit of colour in the midst of a wilderness—bright and fresh after ten years' existence in the Haymarket. Corsehill stone also possesses the advantage of being more colourous in wet than in fine weather.

Red and grey granites have good natural colours, which, however, are subject to the same obliteration in street architecture as the tints of humbler materials. If unpollished granite when used in plinth bases could always be given an inclination from the vertical, the colour would longer remain visible, and a clean effect be obtained. The introduction of polished granites in the small panels of stone fronts fails to give the colour relief desired, for even the shallow recess of a sunk panel affords sufficient shelter to allow of the formation of an opaque film which obliterates the tints.

Granites under conditions which, unfortunately, will never occur, would be also truly the best materials in point of colour, durability, and imperviousness for the exteriors of London street architecture—polished granite for relief being used as dressings. But this is the dream of a Utopian age, when the coin of the realm shall no longer hold sway in human concerns.

Of all building materials block marble stands pre-eminently first in point of beauty. A London street front, however, is not the place for it, except under very propitious circumstances.

Colonel Edis, with great courage, has freely used it in the front of the new Junior Constitutional Club. Its position, an open one, good in aspect, and with plenty of leafy trees near to absorb impurities, is eminently favourable. It will, therefore, be interesting to note how the material has weathered at the end of a few years. The pureness of the colour will depend upon the preservation of the surface; if this is soon destroyed, terra-cotta manufacturers will breathe again. It is to be devoutly hoped that the club will retain in the years to come its pristine purity of tone. At present it certainly realises all that could be desired in architectural colour effect.

The use of metals for the purposes of decoration in street fronts is evidence that there is a desire to brighten things up a little. Experiment in this direction is risky, however. The large metal caps and bands on the marble pilasters to the front of the Tivoli Music Hall were very bright and striking once, but—they are another colour now.

In viewing the chiostro of the London street, compo and plaster work cannot be ignored. In the light of architectural knowledge in the last decade of this century, compo is a most unarchitectural material. The marked prevalence of it in the well-to-do quarters of the town, executed, I suppose, some forty or fifty years ago, exhibits the marvellous strides architecture has made since that time. The acres and acres of compo work in the north-west of London, and around the whole of the Regent's Park district, and brought right into the centre of civilisation by that graceful artery Regent-street, shows very plainly that this material was in great favour at one time and used by men who undoubtedly possessed a keen appreciation of the value of breadth of treatment, and boldness of detail, but who troubled not about colour. What the effect would be if the natural colour of all this compo work could be seen is not pleasant to imagine. The tints that meet the eye range from a warm stone to mahogany colour, both good in oil.

The milk-white effects that enter so largely into the colouring of Continental towns and cities exist mainly in plaster work. Modern London contains few specimens of such, a fact that I do not think is to be regretted, as such effects are usually coupled with bad building.

The consideration of plaster and compo work naturally leads on to the subject of colour put on with a paint brush, and, I must confess, to a feeling of uneasiness in dealing with it. On the one hand, one knows what Regent-street, for instance, and the many miles of suburban architecture would be like without the four coats of common colour, Bath-stone even in many cases owing its continued existence in a London atmosphere to the protective agency of white lead and oil. On the other hand, it appears to be the lowest depth of technical immorality to cover the externals of architecture with a coat of paint. In endeavouring to justify its use, one is led away by the seductive appearance of the nice, clean, stone-colour effect on a fine spring morning, when the cradle has been lowered. It is such a vivid reminder of what the colour of honest building materials might be in brightness and tone. As practical men, I suppose we must endure it as a necessary evil, but, as artists, avoid it like a plague. The greatest bar to its favourable consideration no doubt lies in the abuse of the medium. Tints ranging from salmon pink to navy blue on street fronts do not add to the artistic colouring of London street architecture. The only safe course, then, perhaps, is to forswear the use of any building material that is ever likely to stand in need of a coat of paint.

There is one important material yet to be dealt with, and as the colour effect of terra-cotta formed originally the central motif of this paper, it would appear desirable to say something about it, although criticism on the subject, like the material itself is very nearly done to death. When terra-cotta first came into general use it was thought that at last a material had been found which would revolutionise the colour effect of the old materials and open up a brighter prospect for the jaded Londoner. This material has now had at least fifteen years' experience. We are, therefore, in a position to review how far results to-day agree with the original promises.

The colours of terra-cotta when used sparingly in a front certainly tend to enliven the inevitable dreariness of the brickwork with which it is customary to use it. I am strongly of opinion, however, that it is a great artistic mistake to use the material for the whole exterior of a building from plinth to chimney top, or even for wall

surfaces of any extent. Of the many terra-cotta colours in general use the reds, on account of their heaviness and density, are, in my opinion, the least satisfactory. Although great strides have been made since the Constitution Club was erected, a more uniform shape and having been obtained, yet the general effect of some of the last examples we see around us is worse than the first. A new colour, technically termed chestnut buff, is pleasing in tone and tint, is one that would harmonise well with the natural red brick colours, but I am unaware of its use in London. The pinky and golden browns are certainly the most pleasing tints when properly used; but, alas, the beauty in this, as in much else, is stated to be fleeting.

It may be instructive to examine a particular example of the application of the material under consideration. The Natural History Museum, South Kensington, by Mr. Waterhouse, unquestionably the best instance of its use that could be taken for review, as reliable criticism of the colour effect in this building would be of standard value from the fact that any conclusion arrived at could not well be modified by the chance of a higher perfection of manufacture being attained in the future. Although, as I have said, terra-cotta appears to be unsuitable for any work of a monumental character, from many points of view the Museum is a very beautiful building. The great satisfaction that one feels on contemplating the design, however, is qualified by the startling cleanliness and freshness in the broad surfaces so long after completion. The characteristics, it must be allowed, are not the constituents of artistic repose in colour. One therefore led to the inevitable conclusion that the satisfaction experienced arises from the architectural conception and beautiful details, rather than from the colour effect. In support of this conclusion we further notice that the upper parts of the composition, the top stones of towers and pinnacles, and particularly the series of gabled dormers, are aggressively bright in tone, clean as fresh as when first built. The general surface of the façades, sheltered by the main cornice, is of a uniform tint, of a lower scale than the parts first mentioned, while the series of recessed windows under semi-circular arches are strongly emphasised by a visible layer of dust and so obliterate the colour. It is this palpable cleanliness in the sheltered parts of terra-cotta that is so objectionable, whilst the exposed portions have a bizarre effect. The eye wanders over the composition seeking in vain the repose of one weathered block, and we leave the scene with an impression of a bold beautiful design wrapped in a mantle of a monochrome strip with bluish grey, and, perhaps, repeating the lines of Byron:

So clean, so sweet, so deadly fair,  
We stare, for such is wanting there.

One could hope that some note of the probable appearance of this building, say, a thousand years hence, might be handed down to posterity, to meet the eye of Macaulay's New Zealander when in the ages to come, he takes his stand on broken curb of the Exhibition-road to sketch the ruins of the Imperial Institute, to the exclusion of the Museum as too new looking to be noticed.

Coming next to the Constitutional Club, Northumberland-avenue, it would be ungenerous to be strictly just in expressing an opinion, for the club is without doubt a hopeful spot in the surrounding gloom. We do not see the vivid freshness of the Natural History Museum instead, precipitate of grime, not in sheltered portions only, but all over the composition and in an absence of any pretence of weathering—making one long to take a broom and clean thing up a little. Terra-cotta fronts in busy thoroughfares stand in urgent need of an annual spruce clean.

Much the same criticism applies to the French Church in Soho-square as to the Natural History Museum, on the score of an absence of repose in colouring in the material. The street front impresses me as particularly hard and unsympathetic in tone, but, needless to say, very clever in design and detail.

The restrained application of the material to dressings by some architects of eminence does not lay terra-cotta open to the same strictures as when used for general wall surfaces. Some of my remarks on the colour effect of this material may appear hypercritical in view of the improvement it introduced, when sparingly applied, has made in London street architecture; but I have considered the material *per se* and have confined my review to the best examples extant. There are specimens in Oxford-street and Piccadilly Circus that exhibit colour effect in terra-



otta to be infinitely worse than anything that rock brick or bad stone has ever produced. I have examined the material at its best and at its worst, and have come to the conclusion that the slough effect of terra-cotta after fifteen years' experience has brought the problem of dispelling the gloom in London street architecture no nearer a solution.

Having now critically reviewed the colour tints of some of the possible and some of the impossible materials seen in our streets, it will be gathered, I think, from the foregoing that I hold the view that not one of these materials as now used do much to brighten town existence. How an improvement be effected? First, I think, by revolutionising the almost universal practice of assigning cornices, window heads, strings, and bells, with the idea of throwing the rain off the surface of the building, of sheltering a great portion of it from the action of the wind, and of preventing the sun shedding its gentle influence upon the composition. This change, however, will not entirely prevent the deposit of soot and dirt on the most sacred portions of the fronts. If we are to obtain the best weather effect possible, and in a measure retain the self-colour of building materials, all parts must be designed so as to allow of the surfaces being exposed to the full effects of the elements.

As to the treatment of wall surfaces. The rigid requirements of light for the interior prevents an arrangement of much breadth in colour effect. It would seem then all the more necessary that the flat surfaces that do remain to us after the window space is allotted, should not be further taken up by arbitrary variations in colour and material. The least unsatisfactory specimens of architectural colouring are to be seen in fronts that are either all stone or all brick throughout. The monotony of the London street in form and colour would be greatly affected if the roofs of buildings were designed so that a greater portion of them than is visible at present could be seen in the long perspective of a thoroughfare. The roof material keeps its colour and weathers better than any other part of a building.

Green tints of slates and the reds and browns of tile, if more in evidence above the cornice or parapet, would do much to brighten the scene. The introduction of a single gable here and there is an excellent means of showing a flank of the roof, but the repetition of French, English, Dutch, and Flemish samples all down the street actually shuts out all roof colour from view.

There are many other details that would suggest themselves in working out a design if the great principle of arranging every part, so as to allow of fullest exposure, be kept in view. If it were done, an improvement would soon be seen in the colour of the London street, although the effect would be far from what it might be so long as ordinary building materials, as generally used, remain the medium for architectural expression. There would still remain the deleterious effect of narrow thoroughfares and cramped surroundings. The real problem to be solved resolves itself into the question Is there a material suitable for use that will retain its colour or even present a semblance of pleasantness in a town atmosphere for a lengthened period of years? The porous and impressionable bricks and stones will not, and of terra-cotta my observation tends to show that unless highly vitrified, its colour is marred by the visible staining of dust and soot, which in any case either weathers into the material nor is washed off by the rain. The more extended use of a glazed material then, seems to me the only likely solution of the problem, but before our salvation comes from this direction, a huge barrier of prejudice will have to be beaten down. The discussion to-night could not take a more useful turn than by examining the nature of these taints and prejudices to see how far they are based upon reasonable grounds.

In the first place, prejudice may arise from the fact that the ancient past has no precedent to offer of the use of glazed materials as we would expect them. If it could be found in our Fergusson's Gilt that such and such a basilica was so covered so many hundreds of years ago, London would be a brighter and cheerful city to-day. The natural surroundings of the monuments of architectural antiquity did not demand an imperviousness to preserve their colour effect, and such materials were not used. If there is one thing more than another that the builders of old were aware of, it was the designing of their architecture to meet the needs of each particular case. It appears, then, as practical architects, if we are to be strictly archaic, that our mission, as far as colour is concerned, in London, is to design

to meet the requirements of a dull and disintegrating atmosphere, and not for the environment of a bright and sunny climate.

Prejudice again may arise from the objection that glazed work is an unreal and unarchitectural material—as to the unreality, it is advanced that the material is not throughout all its parts the same as it is on the face. The glazing is stated to be an artificiality and a sham, a superior facing to a baser backing. I will not wade into the ethical reasoning that this statement provokes, as it might be difficult to get back into the shallows again, but I will say that to assert that any one material created for the use of man is in itself better or worse than another is saying that which cannot be supported by any logical process of reasoning—one material may be more useful in one set of circumstances than in another, but that is no criterion of the actual intrinsic merit of that material. The mere commercial value placed upon a commodity by the manufacturing and trading instincts of a community never can be a true standard of relative value of one material to another. If this reasoning is correct it is wrong to say that a glazed material is a sham.

As to glazed work being unarchitectural, I will be content with the statement of the general principle that all materials within reach of architects that promise to serve the needs which call for their use, are rock, stone, and barrel architectural materials—whether Solomon of old or Jones of to-day has or has not used them.

So much for the objections prompted by sentiment. What are the practical arguments against the use of glazed work in the externals of our architecture?

First, the difficulty of treating the material successfully from the artistic standpoint. This I admit as a most real objection; but one that would vanish on the growth of familiarity with the possibilities and limits of the material. A bad design in glazed work is very bad. The effects presented by a large restaurant in Oxford-street and a small one in Buckingham-street, to the latter of which our President can testify, in themselves are enough to ruin the chances of a successful advocacy for the general introduction of this material for a long time to come, and the kindest thing to be said of these two instances is that they were experiments in a little known material. On the other hand, the example of Great George-street exhibits, I think it will be agreed, a very successful application. This is not an exclusive application, but it sufficiently indicates that the material in the hands of a capable designer gives a very pleasing effect. One drawback, namely, the play of light on the glazed surface, is not a serious one, for it is only seen from positions at very acute angles to the point observed, and as this position on looking up is two or three feet away from the base of the front, or on viewing sideways halfway down the street, the play of light does not obtrude; these positions, moreover, are not such as one would generally select to examine the colour effect of any front. More than this, the inevitable film, of which it is impossible to be rid, although very slight, is after a time sufficient to neutralise the play of light on the surface.

I would ask your attention for but a few moments longer for the purpose of following more positive reasoning in favour of the use of glazed work in architectural exteriors. Its extensive use for internal decoration in areas and in other positions where light and cheerfulness are required is sufficient justification, if any further is needed, for its unqualified use in street fronts. If I mistake not, the glazed decorations, whether as tiles or bricks in casings to columns, in panels and mouldings used, as it has been in many of our largest clubs and public buildings, not to mention public-houses, is there to please the eye and cheer the spirits, and well it does this, too. Then why in the name of common sense should the front door-mat be the uncrossable barrier that prevents the legitimate use of glazed work on the street front?

The application of glazed work to mouldings and enrichments is as suitable for external as for internal work, and, from the maker's point of view, quite as practicable. The capabilities of the material would demand simple and dignified treatment rather than elaboration, and I am assured on inquiry that there is no practical reason why every part and detail of a front should not be built in glazed work. I do not think this exclusive application would be the best artistic treatment, but it is possible.

Assuming that the general use of glazed materials has come within the scope of practical politics, can we obtain that range of quiet, subdued, and pleasant colours, without which we shall not improve on the present condition of

affairs. I will not say that the tints now in use are all that could be desired, but an intelligent demand would create a better and more varied supply. The white variety of glazed bricks might be considered too cold for artistic effect. Delicate cream colour, on the other hand, would appear suitable. A nice specimen of this tint may be seen in an enclosed internal area of the new Admiralty extension visible from Spring Gardens. Facework of this colour, with terra-cotta or stone dressings as a compromise, would, I think, make a pleasant combination. A very wide field for good and original treatment is opened by the choice of light and dark reds, golden browns, and other much less conventional colours.

It is too much, perhaps, to expect the older hands in the profession to be the pioneers in the field of glazed work. It is to the younger men, whose aspirations are not bound down by the iron bands of use and tradition, that the colour of London street architecture must look for its salvation. Unfortunately it is the experienced who would be the most capable of showing the world how glazed materials could be most successfully treated, and that they can be so treated already have some visual evidence. But as in all else, I suppose we shall learn most by the failures. Sufficient evils must be choked in the weir before the live ones can slip over, and it will be our fate if ever glazed materials come into general use to experience many shocks before the eye will drink in satisfaction from a vista of good, cheerful harmonies in glazed materials.

If the remedy for the present dismal colouring in the London streets does not lie in the directions I have indicated, and we would do our duty as a body of architects to our clients and to the community at large, the subject must be pursued further, until a remedy has been found that will enable us to bequeath to the generations to come a brighter and more cheerful city than it has been our lot to inherit from the architects of the past.

Mr. Crace, in moving a vote of thanks to Mr. Beale, said he was not all clear whether Mr. Beale had advocated the charm of colouring by weathering, or whether he proposed to do away absolutely with all chance of weathering. His last remarks rather led to that supposition, because with glazed ware once erected the colour was there for good and all, except so far as a film of soot might attach to it. On the other hand, he could not help thinking that Mr. George would never have been induced to go about London making those charming sketches which they had the opportunity of seeing that evening if London had been built in a glazed brick material. Half the charm of colouring was, he was afraid, due to Nature, which, after the hand of man had done its best or its worst, came kindly and reduced all to a harmony, which far surpassed anything that man could originally put there. He confessed that he would be very sorry to see this great city reduced to a system of glazed brick building. It was true that we were troubled with an atmosphere which was extremely destructive of the material itself, as well as of the original colouring; at the same time we got some gain out of it, and he ventured to think that the casual passer-by on the top of an omnibus at the corner between the Post-Office and St. Paul's Cathedral could hardly fail to be very strongly impressed with the idea that there was some beauty in the colouring which was imparted by the London atmosphere, heavy though it be. If there was prejudice about anything it was about stucco, and yet they need not stop at any point in antiquity for examples of stucco. They could get stucco 1500 B.C., and certainly they had very good examples of external stucco work in architecture in Pompeii. The great mistake made in stucco work in London, more particularly at the beginning of this century, was that the architects who used it did so with a sort of endeavour to represent forms of architecture, which could only be represented with dignity in the solid material. If the material stucco was recognised and dealt with as such he, for one, thought that inasmuch as they had the leasehold system, which made them think themselves lucky that they had got forty or fifty years to build upon, there was something to be said not altogether unfavourable to stucco. Then, perhaps, it was not unnatural that he should go a little further, speaking not of public buildings but of street or suburban villa architecture. If they admitted that it was possible to use stucco in that way, should they not also deal with it with the paint-brush in such a way as to add something of charm to it? One or two instances had been

(Continued on page 198.)



### ARCHITECTURAL DRAWINGS FOR THE ROYAL ACADEMY.

DRAWINGS which are sent to us to be photographed for illustration in the *Builder*, and subsequently delivered at the Royal Academy by our agent, must be sent to the *Builder* office not later than 5 p.m. on Friday, the 30th; but we hope those who can will send them earlier than that.

We must point out that we do not undertake to deliver drawings at the Academy except such as are sent here for publication in our pages.

We cannot undertake to affix labels to drawings; the labels required by the Royal Academy must be affixed to the drawings before they are sent to us.

We must also point out that we do not wish for drawings which have been photographed for any other publication.

### Illustrations.

#### THE CHURCH OF SAN ZACCARIA, VENICE, &c.

THIS and some other well-known Renaissance buildings—Santa Maria della Salute at Venice, the front of the Certosa at Pavia, and the view of the Château at Blois—are published in this number at the request of Professor Aitchison, in order to illustrate the remarks made upon them in the sixth and closing remarks of his thoughtful series of lectures on "The Advancement of Architecture" delivered to the students of the Royal Academy, and printed in full during the last six weeks in our columns.

#### DESIGN FOR BATH PUMP-ROOM EXTENSION.

We give the geometrical drawings of Mr. Brydon's design for the proposed additions to the Bath Pump-room, which obtained the first premium in the recent rather too notorious competition.

We gave some description of the design in our review of the drawings in the *Builder* for February 10.

In his report accompanying the design the author remarks that the problem set by the Mineral Baths Committee is unique, as it involves the roofing in and enclosing of an ancient Roman building, while he had also to consider the architecture of the existing Grand Pump-room. The scheme adopted has been to connect the new Concert and Promenade Hall directly with the Roman Bath at one end, with the public and other rooms interposed between it and the Grand Pump-room, and in some respects common to both. This has the advantage of preserving the monumental character of the buildings all round the site; the Pump-room, the Concert-room and the Roman Bath each expressing itself externally to its full extent.

The area under the Concert hall is occupied by a museum, opening, as seen in the section, into the Roman bath at one end. In the treatment of the Roman bath a monumental simplicity has been arrived at; the columns are Roman Doric of the simplest type, standing on the remains of the old piers as pedestals. The space is thus divided into a central hall with surrounding aisles.

The external walls would be faced with Monk's Park Bath stone; the interior of the Roman bath faced with stone up to the cornice level, and above that, with the vaulting, finished in adamant plaster, which would be impervious to any damp from the steam of the bath.

The roof of the Roman bath would be constructed with iron principals, covered with red Italian tiles; the roof and dome of the Concert-room also of iron construction, the dome covered with lead, and the rest of the roof with slate. The floors to be of rolled iron plates and concrete, with wood block flooring in oak and walnut for the Concert-room, deal floors for the other rooms, and cement mosaic for entrance halls, corridor, and terrace.

Ventilation would be secured in the Roman bath which would always be warm enough from the water, by specially designed opening casements; the Museum and Concert-room would be warmed by hot water in pipes and radiators, fresh air being introduced through the radiators in winter.

The estimated cost is 25,200/.



Plans of Swan Buildings.

#### PROPOSED HOUSE, MARGAM, S. WALES.

THIS illustration shows the preliminary sketches for the two principal elevations of a house which was proposed to be erected for the agent of Miss Talbot, on her estate at Margam, S. Wales. Unfortunately, the plans have been lost. It was proposed to carry out the elevations in Luton bricks, with stone dressings and part vertical tiling and half timber work, and to cover the roofs with Coalbrookdale tiles. Messrs. Cheston & Perkin, of London, are the architects. The drawings were exhibited at the last Royal Academy.

#### SWAN CHAMBERS, E.C.

THIS building is erected on a somewhat irregular site, and is planned for two suites of offices on each floor, which admit of a connecting passage if required. They were built by Messrs. Woodward. The fireproof floors are by Messrs. Homan & Rogers, and the sanitary work by Mr. R. Crittall.

The architect is Mr. Basil Champneys, and the drawing was exhibited at the last Royal Academy Exhibition.

#### COMPETITIONS.

**DARLINGTON MANSION HOUSE.** Eighty-four competitors sent in designs in this competition, and the Assessor (Mr. J. Macvicar Anderson) has placed the premiated designs as follows: 1st (premium of 150/), "Ad Red" and (100/), "Lactical"; 2nd (50/), "Santo Claus." The authors of the first-mentioned design are Messrs. Clark & Moscrop, of Darlington. Mr. H. A. Cheers (of Twickenham) and Mr. G. Gordon Hoskins (Darlington) were second and third respectively.

**PARTNERSHIP.** Mr. J. Howdill, architect, has removed from Oxford-row to 24, Albion-street, Leeds, having taken his son into partnership; in future his practice will be conducted under the style and title of Howdill & Howdill, architects and surveyors.

**MCDOWALL, STEVEN, & CO., LTD.**—We are informed that Messrs. Steven Bros. & Co., architectural ironfounders, of Upper Thames-street, have registered their firm as a limited company under the title of McDowall, Steven, & Co., Ltd. The business will be conducted as heretofore, and under the same management.

#### THE ARCHITECTURAL ASSOCIATION.

(Continued from page 197.)

executed within the memory of those present which, he thought, were excellent examples, and made a very great improvement in the appearance of the street front by the application of judicious colouring. One was Novello's music-shop in Berners-street. It formerly had a hideous plain front, but by an extremely able command of the paint-brush the front was made a very presentable and pleasant object to look at. Then there was the Alhambra in Leicester-square, which had now been altered, but which, two or three years ago, presented an extremely beautiful piece of external colouring done in paint. It was quite true it was evanescent, but for the time being it presented something preferable to a stock brick front. Therefore, he thought they should not let prejudice control one system of external decoration rather than another. Another thing which he thought had perhaps been a little overlooked was this: A great many of our town buildings only required to be painted on. Some sixteen or eighteen years ago the Mansion House was treated to a course of fire engines, and the result was a very beautiful tone of colour, displayed with a great variety of weathering, and a charm which certainly any architect might very well be satisfied to see exhibited in his building. He thought, therefore, they ought not altogether to suppose that their only salvation was in glazed work. He would be sorry to see the more important buildings of London executed in glazed work. There were other means of relieving brick buildings with some colouring—methods which would bear exposure, and which would to a certain extent give some relief to the monotony of a dirty front. He recollected having seen one or two very clever uses of mosaic on a large scale as friezes, and string-courses, which it might also be well to bear in mind. This fact also should not be lost sight of, that in a sunny climate they could stand a brilliancy of treatment and the use of a strength of colour which in London would undoubtedly be disagreeable. The whole question of the strength of colour which might be used in different climates was a little complicated, but it was partly dependant on what may be called anatomical mechanics, because when they were in bright climates the natural action



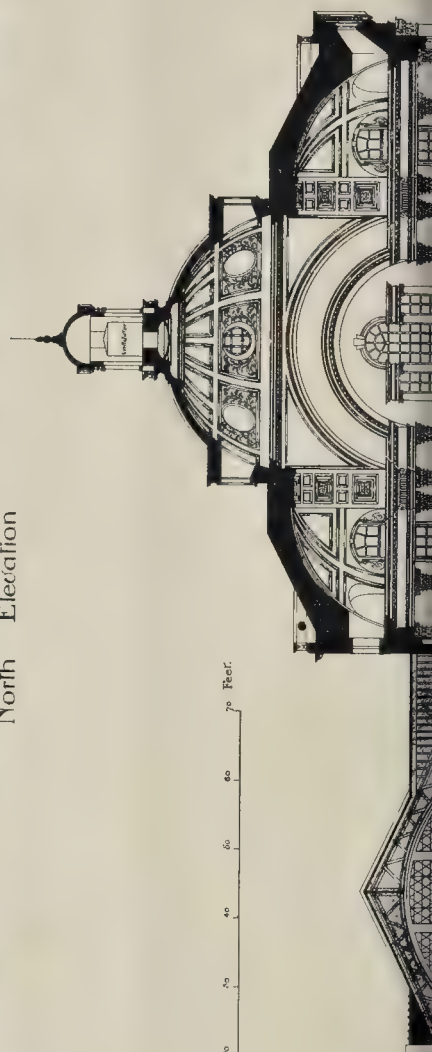


THE BUILDER MARCH 10, 1894.



North Elevation

0 10 20 30 40 50 60 70 Feet.







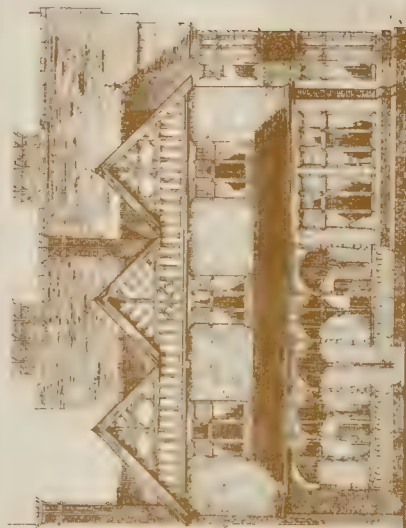






THE BUILDER, MARCH 10, 1844

Proposed House  
Margam  
for Mrs. F. Allen



West Elevation

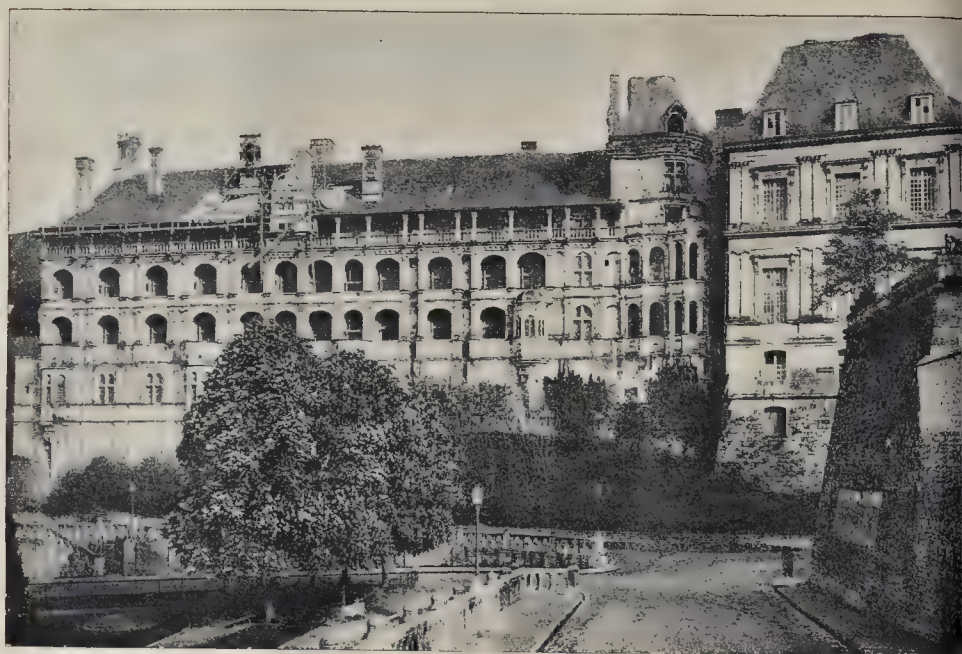


(Note: The plan is not  
a section, but  
Old Fagad Street)

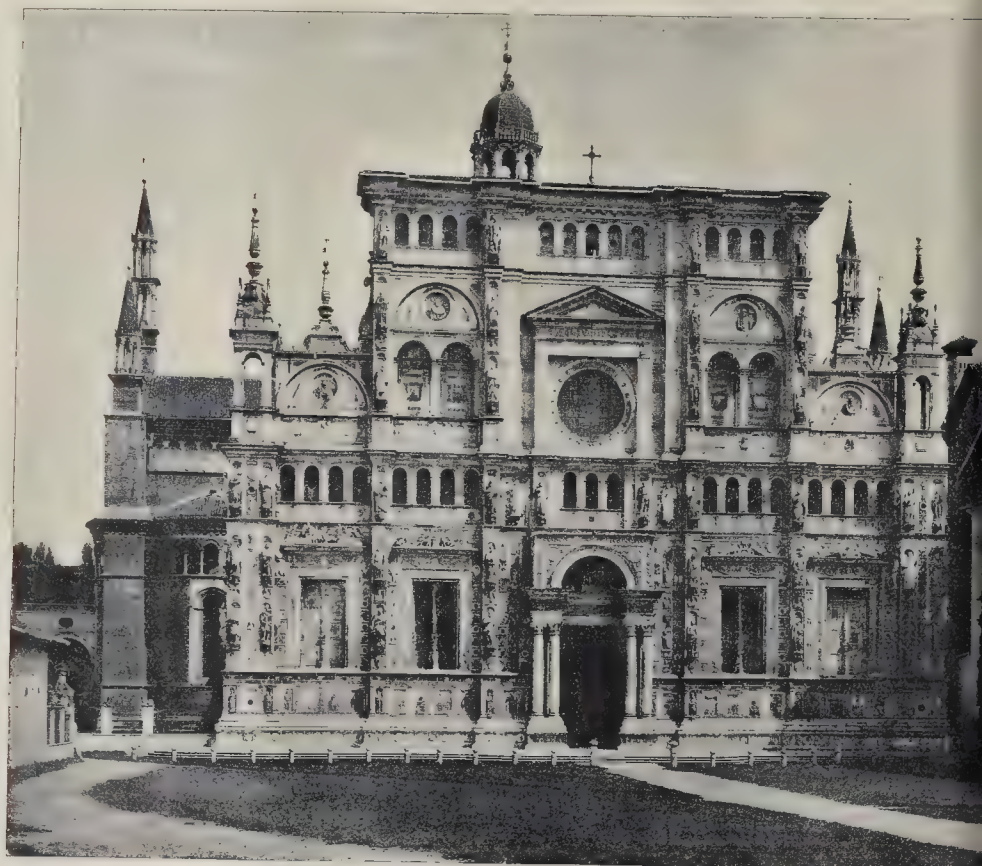
South Elevation







THE CHATEAU OF BLOIS



FAÇADE OF THE CERTOSA, PAVIA

*(Published as Illustrations to Professor Atchison's Royal Academy Lectures.)*

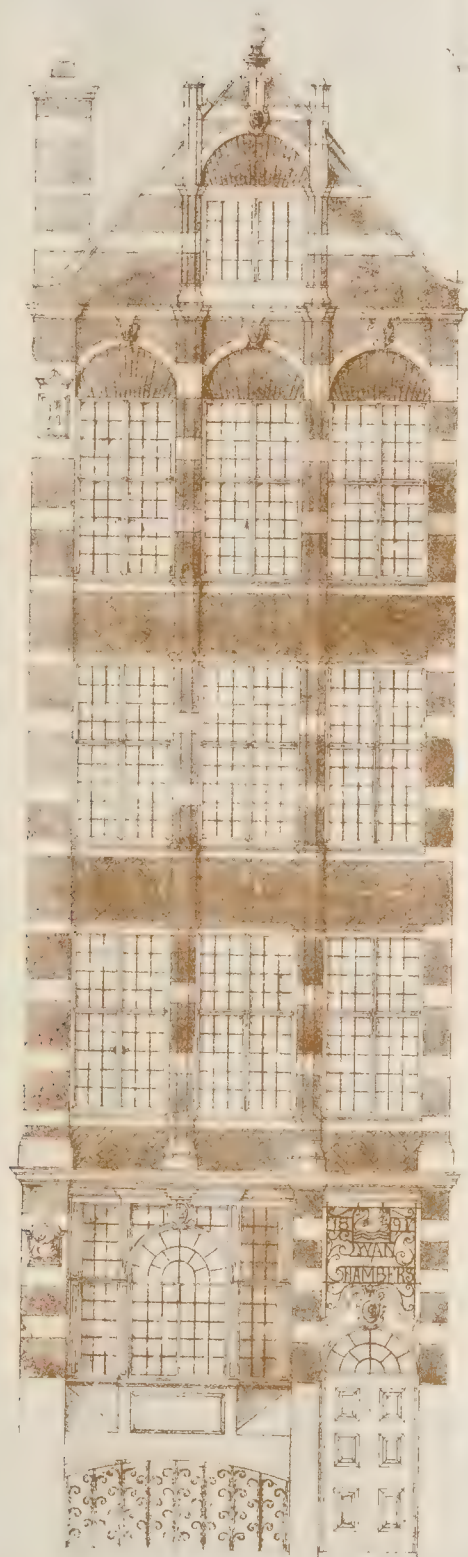


SANTA MARIA DELLA SALUTE, VENICE.

*(Published as an Illustration to Professor Atchison's Royal Academy Lectures.)*







SWAN BUILDINGS, E.C. M. BAS. CHAMBERS ARCHT.



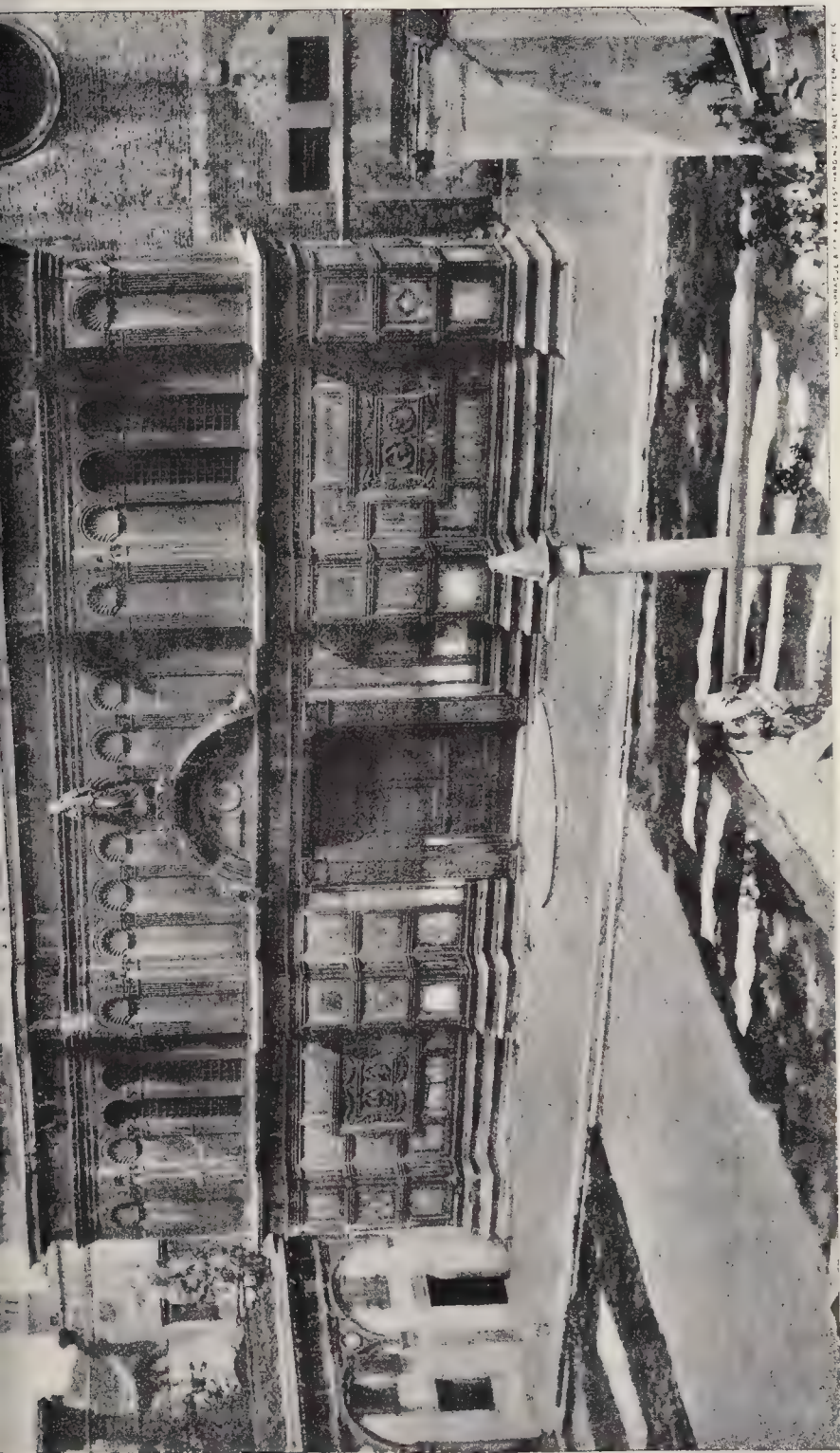






THE BULDER MARCH 10 1894.





FAÇADE OF SAN ZACCARIA, VENICE  
(Published as an Illustration to Professor Atchison's Royal Academy Lectures)





of the muscles of the eye was to contract the pupil—the opening through which the act of vision took place—and that acted in precisely the same way that the putting in of a small stop to a lens did in photography. This reduced the whole of the illuminating power—that was to say, they stopped the action in the nerves to a great extent. It therefore followed that when they were looking at a bright colouring in bright light it looked harmonious and beautiful, whereas if they saw a street with bright coloured flags on a dismal day they had a sense of garishness and not of harmony, which was exceedingly disagreeable. If they had any great amount of gay or brilliant colour in the streets of London they would find it extremely unpleasant and inharmonious, even if they could regulate the succession in which the various coloured exteriors were to follow each other. As a matter of fact, owing to the existence of different tenures, they could never tell what colours might be adopted by their neighbours.

Mr. A. Wallace Rivington said it gave him very great pleasure, as a painter, to hear such eloquent advocacy of more colour in London. He was afraid he could not quite agree with Mr. Crace's otherwise admirable remarks as to the danger of having too much colour in England. It did not seem to him that strong colour became garish under a grey limatic; in fact, it appeared to him that they could stand quite as much colour in a northern country like England as they could in a southern. There was very much created in a southern country by what he might call reverberation or reflected colour. He had noticed that a very small quantity of colour was often reflected backwards and forwards in a sunny street, and intensified itself, so that in many southern towns when one was painting a street which seemed to be full of colour, the amount of local colour, as a matter of fact, was very small indeed. It seemed to him that Mr. Beale had been a little hard on terra-cotta. As a painter it was very pleasing to him to see some of the newer red buildings in London. He might be wrong, but he could not help liking them, and they often had obtained much "quality." Then, to paint, he agreed with Mr. Crace that a good deal could be done with paint, perhaps not in the form of oil paint, because it tended so to obliterate detail and to give a disagreeable glossy surface; but paint treatment in the form of wash or stain was very largely used in southern countries and produced very delightful effects, especially when it had been to a certain extent disintegrated and worn away by time. He could not help thinking that they might employ it very cheaply and artistically in England, if not in London. There were two points with regard to colour, to which perhaps they would pardon him referring. The first of these was the great importance of quality in colour. A plain flat surface of colour was never so agreeable as a broken-up surface, where the colour was more or less unequal all over. He thought one great defect of a great deal of modern glazed work was the uniformity of the colour. The workman got a surface which was perfectly flat, and lost the great charm which exists in much old work in consequence of the irregularity of the tone. One noticed that very much in some of the restorations in the south in Spain, for instance—where glazed work was used to a great extent, in the form of *azulejos* or tiles. In the second place, they got the best effect when the colour was not only broken that way, but when it was qualified to some extent by other colours being present in small patches—that was to say, supposing they had a surface of orange, if they had small particles of the complementary telling through, the effect would be very much greater. That could be obtained in a number of ways artificially; certainly was obtained in mosaics. Much old work in mosaic decoration, however, looked poor as compared with the old, in which there were numerous irregularities. There was one point in regard to colour, and that was that almost all the finest work the strongest colour is not in the highest lights. It seemed to him that it would be well to place strong colour in shadow where it was more or less in shadow, and paler tones where it was more exposed to the light.

Mr. E. W. Wimperis thought Mr. Beale had been overdone the shadowy side of the London streets. We did get sunshine in London occasionally, and when we did he thought the colours came out of old stock brickwork—everything except glazed surfaces—was very charming indeed. Personally, he should prefer to lay slate, if they were going to do anything of the sort, in favour

of colour for sunny days, rather than take too much into consideration the number of grey days we have in the course of the year. With regard to the strength and brightness of colour, he did not think we need be at all afraid of erring on the side of having it too bright. The London atmosphere would undoubtedly correct that in the course of a very short time, and the result would be that they would have a better effect if they began by allowing for that. As to the advisability of glazed surface work for colour in London, he was not at all in accord with Mr. Beale on that subject. The little house in Great George-street, to which he had referred, owed its charm entirely to its composition and treatment generally, and not to its glazed surface; in fact, it was charming in spite of its glazed surface. He thought one of the mistakes which those who had had opportunities of dealing with coloured materials in London had made was that they treated their subject without giving it sufficient breadth. The Natural History Museum at South Kensington was a very charming building indeed, but he thought the effect of it might have been made a hundred per cent. better if the colour, instead of being spread in stripes, &c., on the Zebra principle, had been massed, and the darks kept by themselves in the lower bays. The very nice colour of those stripes, which left Mr. Beale with such a favourable impression, would have been very much better kept entirely by themselves, and the rest of the building treated with much greater breadth. With regard to paint work, he was very glad to hear Mr. Crace suggest that stucco-painted was a thing which they, as architects and artists, must accept, and as artists they should grapple with the difficulty—accept the stucco and the paint, and do the best they could with it. As regarded outside painted stucco houses, he did not see why they could not treat them the same as the inside of a house. The inside walls were generally treated as dado, filling and frieze, and he thought the same principle might be adopted in regard to outside work.

Mr. W. D. Carle said he could not help feeling that there was really only one genuine colourist of architecture, and that was Nature. If Nature was charged with smoke they must accept it as such, and therefore he thought they ought, in designing their architecture, to design it so that in course of time it would become beautifully coloured by Nature charged with smoke. London as one huge washhouse would be something too terrible to conceive. The effect of the London atmosphere, which was really Nature charged with smoke, upon certain building materials was undoubtedly charming; the effect of the London atmosphere upon glazed buildings was likely in the long run to be detestable. The great element of design in London architecture was breadth—not only breadth of colour, but breadth of design; and if they began on those principles and chose the right material, he thought they would get the right effect. He felt sure that there was no building stone so charming in any town, whether the atmosphere was clean or not, as the beautifully weathered and well-chosen Portland stone in London. Mr. Beale had advocated the use of terra-cotta, if at all, in connexion with bricks. He (the speaker) was not quite sure that he was right, because the bricks would turn to the tints which the London smoke would give them, while the terra-cotta would remain for ever hard and glaring.

Mr. Halsey Ricardo, in supporting the vote of thanks, said: In clear atmosphere Time works on the architect's behalf, flinging a broodery of texture and colour over his work, but in manufacturing towns Time's hand is against the architect, and, with Time's permission, the corrosive gases of the atmosphere gnaw into and devour his building. Stones and bricks that were fortunate to weather themselves a century or more ago, when the air was purer, acquired then a face of flint which to-day defies the biting venom of our air, but we could not hope to build under such conditions. If, then, we are denied texture, we are driven with all the more force upon light and shade and colour. But, as Mr. Beale had pointed out, there were strong reasons against getting our shadows by projections. But by colour we could get the effect of shadow. Colours in English cities—where the light is dimmed by the smoke from manufactories—should be rich and full. Abroad, where the sun shines fiercely, we could use garish colours, because the glare of the sun and reflected lights give gradation and modify crude tints, and the deep defined shadows produce supplementary colour harmonies. We are used to full rich colours. Our landscape consists of these, compared to the prevailing grey, dusty, pale landscape abroad,

Bright light blanches colour: the time when colour is at its fullest and finest is in the gloaming. Absence of colour is felt by the most ignorant to be a want in our streets. On festivals our first impulse is to provide it by means of flags, streamers, and flowers. What an animating spectacle was a troop of red-coats passing through the streets! One's pulse beats too more to the minute! In the coming happier days let us hope that we may see cardinals in scarlet strutting with peacocks in every square, squads of soldiers in uniform marching down our thoroughfares, and the Lord Mayor, in his gilded barge and with his glittering retinue, taking his daily stroll up and down the Thames. If we used colour we need not use mouldings. We can get our shadows and half-tones direct. Stone carving, stone, brick, or terra-cotta ornamentation and mouldings are a mistake in a city like London. They were bound to perish miserably in the corrosive acids of our atmosphere, and, whilst undestroyed, are rendered ridiculous by the deposit of dust and grime. Mr. Beale had argued that, accepting the nineteenth century and the geographical and commercial position of London, glazed surfaces were what we should adopt. So he (the speaker) thought. Using them we renounce texture and the softened harmonies got by the lapse of time. But, as Mr. Beale showed, these were virtually unobtainable, no matter what materials we used. With glazed surfaces, however, we got colour, warmth, and cleanliness. A brick-house was as a house built of sponge-cakes; the wind whistles through it, and after each rainfall some tons of water have to be vapourised before we could get our walls warm. Glaze the outside and we were windproof and wet proof. He did not know whether disease germs cling to brick walls—they probably did—but their attachment to a glazed surface must be more precarious. With glazed bricks, glazed terra-cotta, and tiles, we had a most gorgeous palette to our hands. In one's musings of what one means to do in the blessed future, when patrons were trustful, and the fear of the contractor was removed from one's eyes, he saw rise before him the house of his ambition, like an opal in the sunshine, covered from basement to eaves with tiles of richest hues, and this jewel of a house repeat itself in shimmering radiance adown the streets, as he passes through the avenues of the New Jerusalem itself.

Mr. H. W. Pratt said he would hesitate very much to follow the advice of Mr. Beale on the question of glazed brick work. With regard to the colour of terra-cotta and brick work, there were so many varieties in these that he thought they ought to exercise a little more judgment in choosing their materials. If they could only manage to show a little more roof in their street architecture, they could legitimately get colour which he thought would add to the effect of the street. They required to look at this subject from two points of view—the sanitary and the artistic—and they could not reconcile the two.

After a few remarks by Mr. A. W. Earle, Mr. Banister F. Fletcher said the subject seemed to him to divide itself into two portions—permanent colouring and non-permanent colouring. In the former section, Mr. Beale had referred to glazed tiles in terms of praise. He (the speaker) thought there were great possibilities in that material, having regard to the London climate. Mr. Beale had not referred to the use of polished granite. It seemed to him a great mistake to use polished and unpolished surfaces in the same façade. The salmon pink terra-cotta buildings being erected all over London did not seem to weather at all well. As regards the second section one of the speakers had stated that plaster was a very good material. He never saw how they could get any beauty out of a painted plaster front in London, because it became practically effaced in two or three months. The only one that pleased him was the School of Music at South Kensington. As a good example of modern colouring he mentioned Mr. Mountford's new Town Hall at Battersea, in which Portland stone and red brick and green slates were joined together in a manner which, he thought, was admirable.

Mr. Satchell remarked that the public were beginning to awake to the fact that there was something more beautiful than the stock brick and the stucco, to which they had been used so long. It was for them, as architects, to use their influence to lead the movement in the direction of colour. Difficulties not only arose from prejudice, but from the feeling of conservatism which existed. Nature did not intend them to live amidst smoke. They should, therefore, aim at removing the cause, and then they would soon set the City off to advantage. One of the dangers in using glazed brick-work,



was that, in the hands of an unskilful tradesman, the colours might be made too bright.

Mr. E. J. Bacon referred to Mr. Norman Shaw's new police buildings on the Embankment as an example of colour treated broadly.

Mr. W. H. White said there was a new building in Maddox-street in a glazed material and in several colours which had a fairly satisfactory effect. On the whole he was opposed to the use of glazed material. He thought he should like to go back to the texture surface which they got with wickan stone. He was glad to hear something said about overhanging cornices. What they wanted was to rearrange the cornices to get the lines much flatter, so as to save the bad effect of weathering.

Mr. E. Greenop and Mr. Brodie having made a few remarks,

The President said that, amongst painters Mr. Logsdail had shown the beauties of colour in London. In his painting of St. Martin's-in-the-Fields he showed, what everyone must see, that London was full of beauties of its own in the way of colour. It had always seemed to him that one of the most pleasing fronts in London in the way of colour was Mr. Colcutt's little stucco front in Fleet-street. He thought the effect of wall-stucco and stock-bricks was most happy as a street frontage. With regard to glazed bricks, he wished to say one word on behalf of salt glazed bricks. The colour, he believed, was natural, and, what was of still greater importance, it varied in the most beautiful manner. If they took the bricks as they came in and used them firmly, he thought they could not get a more beautiful gradation of colour than salt glazed bricks.

The President then put the vote of thanks, which was passed by acclamation.

Mr. Deale, in reply, said he had taken up the subject simply because he thought it was the only practicable medium by which they could introduce a little more colour into our streets. He would not for a moment put up any large and important building with glazed material, because they were, as a rule, on an open site with the best possible conditions of aspect, and no material, as far as he was aware, was more suitable for such buildings than good Portland stone. Mr. Crace had very naturally said a great deal for stucco. If Mr. Crace thought there was no reason for throwing over stucco he was prepared to stand by the claims of glazed work. When they saw the dismal effects of stucco, he was inclined to think it was most objectionable in a London atmosphere. He thought, with Mr. Rimington, that they should get a certain amount of vibration in the colours of glazed work. He had seen the building in Maddox-street which had been referred to, and he must say it was a successful treatment; he would not say it was absolutely the best manner in which glazed work could be treated in a front, but it was certainly a bright spot in Maddox-street.

A vote of thanks having been passed to Mr. Ernest George and Mr. Rimington for the loan of the drawings which had been exhibited, the proceedings terminated.

#### MAGAZINES AND REVIEWS.\*

The *Art Journal* commences with an article on the works of Mr. John Collier, by Mr. W. H. Pollock, and includes also articles on Stothard, by Mr. A. T. Story, and on Woolner, by Mr. F. G. Stephens. Mr. Story's estimate of Stothard, not very flattering, is we think pretty near the truth. "He is at the best in subjects of a domestic or gracefully ideal description, as in his Watteau-like *flûtes Champêtres*—and even thus when more or less sketchy in handling." The Wellington Shield, Mr. Story thinks, represents his strength apart from his weaknesses. The finest illustration in the number is the reproduction of Mr. Lavery's "Ariadne," a design, however, which is much more modern than Greek in character and feeling.

In the *Magazine of Art* Mr. Claude Phillips writes a critical article, not concluded, on the Exhibition of Early Italian Art at the New Gallery. The attempt of Robert Foulis, in the last century, to found an Academy of Art in Scotland, is the subject of an article by Mr. J. M. Gray, which is illustrated by medallion portraits, including one of Robert Adam, the architect. Mr. Richard Marston's article on

"The object of these notes is to point out anything in the contents of the current magazines which is of special interest to our readers, with occasional brief criticisms on the views expressed in such articles. When a magazine which has been sent to us is not noticed, it is because that number contains nothing that is within our province to comment upon."

"Art in the Theatre" is specially concerned with "the decline of scenic art in America," where it seems that little importance is now attached to scenic effect if the play goes all right. Mr. Marston complains of the disregard of the requirements of the scene-painter shown by managers and architects; in regard, that is, to his requirements of light and space for his studio. We might complain with more reason of the disregard shown by Mr. Marston to architectural style. The illustrations to the article are his own, and if the scene called—"A Byzantine Interior" is his notion of Byzantine architecture, we can only say that he is entirely ignorant of the history and facts of architectural detail. No Byzantine architecture ever was in the least like what is shown in this preposterous design.

To the *Studio*, Mr. Austin Dobson contributes an article on the two Paynes, the bookbinders, reproducing, among other things, the well-known melancholy portrait of Roger Payne at his work. "Taxidermy as an Art," by Mr. Fred Miller, deals with a subject which has not received the attention in artistic journals which its importance merits. "Holland from a Canadian Canoe" is the title of an interesting and well-illustrated article by Mr. F. L. Emanuel.

In the *Nineteenth Century* Mr. Walter Pater commences a series of articles on "Some Great Churches of France," Amiens being the subject of the first article. Mr. Pater's object appears to be, in these articles, not so much the consideration of strictly architectural treatment, as the endeavour to illustrate the main spirit and leading motive of the building, while touching also on its historical aspect and the conditions under which it was erected. One remark we were struck with: in speaking of the colour which once adorned the interior of the building, Mr. Pater doubts if it would be any gain to us at the present day if it still remained in its ancient aspect; we should have found it, he thinks, far too strong and deficient in harmony and repose; the grey harmony of the interior is pleasanter to the eye and mind, and the interest of the masonry surface and its treatment greater to us than the effect of the pigments which once overlaid it. There is a great deal of truth in this. In the same number Mr. E. L. Buxton has an interesting paper, "In the Mountains of Egypt."

In the *Fortnightly* Sir Robert Ball writes on "The Significance of Carbon in the Universe," summing up with the conclusion that it is carbon that mainly produces the light of the sun, as it is also the prominent element in most forms of artificial light on the earth. Mr. J. S. Jeans has a paper on "Railway Development," partly historical and partly critical. In comparing American with English railways, he notices the extremely low rate of goods-train charges in the States, and also the greater length of runs; the average haulage length being 110 miles in the States against thirty-five miles in England. It is self-evident that under such conditions it is possible for America to have a lower traffic rate which shall yet be remunerative; in other words, that "the cost of handling relative to the receipts per ton of traffic is greater with us than with the Americans." While Mr. Jeans notes this as a deduction he does not appear quite to realise what a very self-evident one it is.

In the *National Review* Mr. H. D. Traill enters into some description and criticism in regard to Egypt, and what we might, could, or should do with it, in a paper under the title "Our Cleopatra."

In *Harper's Magazine* "A Steel Tool" is a really valuable illustrated article on the manufacture of steel.

The *Century* contains an article by Mrs. Van Rensselaer on "The Madison Square Garden," as representing, in the writer's opinion, the most beautiful architectural group in New York. The illustrations justify, to a considerable extent, Mrs. Van Rensselaer's admiration, though we do not much admire the "dot-and-scratch" manner in which they are drawn. "Earthquakes, and how to Measure Them," is an interesting article by Mr. E. S. Holden, with descriptions and illustrations of several forms of seismometer.

*Scribner's Magazine* contains an admirable architectural article by Mr. Barr Ferree on "The High Building and its Art." We do not know, however, that we quite agree with the author that no such difficult problem has been offered to the architect as the designing of a building which has height and no breadth. Height is in itself a great element of architectural sublimity; and if an architect has the good luck to have a building which must be of great height and at the same time solid in construction, we should say he is fortunate in his conditions; he is almost bound

to produce something impressive, even by simplest treatment. To be sure the architect the Monadnock Building at Chicago has managed to fail, and to produce nothing very exaggerated cotton mill; but most of the buildings illustrated in the article succeed in being even with very simple treatment. None of the illustrated are more effective than the "able" building at Denver, which was illustrated in the *Builder* of March 18, 1897, the main which consists in the grouping and receding of the lofty masses; the "Union Trust" building at St. Louis has the same kind of excellence the same cause. An article on "The Street Railway," by Mr. P. G. Hubert, is a specimen of the class of articles, at once practical and practical, which the American illustrated magazines have made a special feature. It is well illustrated.

The *Atlantic Monthly* devotes a short notice to "A New Reading of Leonardo da Vinci's shape of a review of M. Séailles's work on great artists. The view of the writer of the is that the most predominant element in Leonardo da Vinci was "the sense of fact"; in which is at least suggestive of reflection.

In the *New K. C.* Mr. Harry J. Miller, in an "Apologia pro Arte Mea," or a defence of his own exhibition against the critics: a subject of very general interest, but he hits a truth which remarks on the limited range of our leading painters. Nature and life have, he becomes divided into small plots, each supposed to be the property of one artist; "the gladiators of the dark blue sea are no longer the property of all—they belong to Henry Moore," "Mr. Napier Hemy has lived for many years now on the colour of green water under a he discovered it one day by chance, and dealers have never allowed him to try a chance," &c., &c., in which there is some and perhaps the dealer (or his public) is at the bottom of a good deal of this.

In the *Contemporary* Lord Hobhouse, in the views of the House of Lords on "Bitterness" and defends the position of the County Council, but we doubt if his article will make any effect on the unconverted.

In the *Gentleman's Magazine* a paper "Fore-glows and After-glows," by Dr. J. McPherson, is a study of the phenomena of sunset and sunrise light and colour, with their effects. Mr. E. O. Walker contributes a descriptive article on "The Chin-Lushai Country."

The *English Illustrated* contains a short article on "Clouds and Cloudscape," by Mr. Douglas Archibald, a contribution to the of a subject which is of perennial interest to

In *L. A. M. J.* at the exhibition of 1898, we have an account of the attempt of Emile Rouze, a contractor well known in North of France, to establish a school of carpentry, the carpenter's craft being apparently no means in a flourishing state in that France, where it is stated that the number of carpenters has very much diminished.

A *Beautiful World*, the quarterly organ of the "Society for Checking the Abuses of Advertising," makes a complaint "concerning chimney pots," meaning especially the device of curing smoking chimneys, and their upsets which indeed (like the chimney pot) is put but in urging that architects should not require these adornments, the writer is not aware what a very capricious thing smoking is in these respects. Its vagaries are reducible to any rule. Of two chimneys, apparently just alike, one will "draw" at other will not; and no one can render a reason some cases at all events. The most practical in the number is an "object lesson" consisting of photographs of two sides of a suburban one side in what may be called its natural state, the other disfigured by a portentous range of advertisements bordering on a property for sale—"look on this picture and on this." True spectacle is a hideous one.

*Punch Pictures*, with its sixth number, completes the first volume, to which is added a portrait of the present editor. We are ready to welcome further volumes.

Under the rather absurd title, "Lions in Dens," the *Idler* gives some account of Marcus Stone, the painter, with sketches of his house, studio, &c. We presume this is to be of a series.

The quarterly number of the *Illustrated Archaeologist* contains a great deal of interesting matter, including description and illustrations of some recently discovered Roman wall at Gloucester.



## THE LONDON COUNTY COUNCIL.

The usual weekly meeting of the London County Council was held on Tuesday at the County Hall, 60, Strand, Mr. John Hutton, Chairman, presiding.

**Protection from Fire in London.**—The Council proceeded to discuss the adjourned report of the Fire Brigade Committee, which provided for additional protection from fire in London. The recommendations of the Committee included the establishment of several new fire stations, additions to the Brigade, and additional fire appliances. The Committee pointed out that if the recommendations were agreed to, the capital expenditure on additional appliances and stations would be about 92,500*l.*, and the charge on the Finance account would be increased by about 300*l.* a year. Allowing for redemption of the loan and payment of interest in respect of the 500*l.*, and in respect of the cost of the new station at Blackheath, the total increased annual cost of the Brigade would be about 29,500*l.*, and to a rate of less than a farthing in the pound.

Colonel Ford moved the following amendment:

"That the Council, whilst recognising the necessity of continuing the policy hitherto followed by the Council of gradually increasing the Fire Brigade to meet the needs of the growing population of London, and of opinion that it should not be asked to provide at once on a great scheme which it will take many years to carry out, and which will involve an increase of 30,000*l.* in the annual expenditure on the Fire Brigade. The Council accordingly instructs the Fire Brigade Committee to bring up a report stating what part of the scheme the Committee considers should be carried out during the financial year ending March 31, 1895, and what charge in respect of capital and maintenance will be thereby entailed."

Alderman Fleming Williams seconded, and, after considerable discussion, the amendment was carried.

Mr. W. Saunders, M.P., moved, as an addition to the amendment, which had become the substantive motion, "That the committee be requested to investigate and report to the Council the desirableness of utilising the high pressure supplied by the London Hydraulic Power Company."

The amendment was seconded by Mr. F. Smith and agreed to.

**Improvement Works, Hackney-march.** The annual report of the Parks and Open-Spaces Committee contained the following paragraph and recommendation:

"Deputations from the Hackney District Board Works and the Hackney Board of Guardians waited upon us to urge us to take in hand as many as possible such works at Hackney-march as necessary to fit the place for use by the public, and, by so doing, afford work for some of the unemployed persons in the district. Although we are naturally actuated by the keenest desire to assist in relieving the distress prevalent in the eastern district of London, we have, in dealing with the question of carrying out works at Hackney-march, only taken into consideration such improvements as are essentially necessary for enabling the people to make use of the place for the purpose of recreation. We assume that the place, having acquired its character of land, will be eventually to utilise it to the fullest possible extent for the pleasure and benefit of the community. Whether it is to be the great playground for the portion of London, or whether it is to be developed for more general recreative or ornamental purposes, is a question that may be settled hereafter. In either case the prevention of floods is a necessity, and the proper discharge of the surplus rainfall is of equal importance. For the prevention of floods, banks or river walls 15 ft. wide at the top with proper slopes alongside the river bank and the Lead-mill stream are necessary, and the footpaths, 12 ft. wide, should be provided on these banks, otherwise the traffic will soon wear away the banks and render them useless as a barrier against floods as well. The banks would form pleasant promenades, and would doubtless be much used. They would afford good views of the playgrounds and fine prospects of the surrounding country, and seats could be placed on them. If the proposed banks be constructed, it will be necessary to improve channels in the river to discharge the waters more rapidly, or else the lands on the opposite side may be damaged. Although the Council has a right to protect its property without reference to results to others, the Council would probably like to carry out its improvements without detriment to anyone else if possible. Moreover, we understand that the Lee Conservancy Board is carrying out works in the neighbourhood of Hackney-march, which will have the effect of sending

flood-water down to Hackney much more rapidly than now, so that it may be necessary for self-protection for the Council to carry out the proposed works. Of course in connexion with new arterial cuts, the first consideration should be their effect upon the beauty of the river. No one would desire to substitute a series of canals for a winding stream except for strong reasons of expediency. But we may remind the Council that at Ladywell recreation-ground this difficulty was overcome successfully by retaining the old channels in addition to the new cuts and forming islands. There the effect has been very pleasing and has given general satisfaction, and we think the same result could be secured at Hackney. We have had before us a plan showing how cuts can be made which would result in the effective discharge of floods, and would permit of the formation of small islands and add interest and variety to the aspect of the river. It may be objected that islands would be a waste of space, as the public would be excluded, and in a sense that is so; but out of so large an area as Hackney-march some small plots may well be spared for appearance sake, and it should not be forgotten that these islands when planted would afford shelter for large numbers of song-birds in summer and wild fowl in winter, and so add to the attractions of the marsh. We further think that a pool should be formed for bathing, there being a great necessity for accommodation of the kind in the neighbourhood, and a part of the tongue of land on the north side of the marsh might well be spared for the purpose. The consent of the Lee Conservancy Board is necessary for any works affecting the river, and that body, we have learned, will facilitate in every possible way the carrying out by the Council of any of the operations above referred to which may affect the property or interests of the Conservancy. The capital estimates for this year contain a provision of 1,000*l.* for works at Hackney-march, and a further sum of 5,000*l.* has been included in the estimates for next year for the same purpose. We recommend:—

That, subject to an estimate being submitted to the Council by the Finance Committee as required by the statute, the Committee be authorised to incur an expenditure of 6,000*l.* for carrying out the following improvement works at Hackney-march:—

- The raising of an embankment alongside the river Lee, so as to prevent the flooding of the central portion of the marsh, and the cutting of new channels in the river with islands near the "White House" as shown on the plan submitted by the chief officer.
- The formation of a bathing-pool by the enlargement of the cut at the northern portion of the marsh.
- The filling up of the old water-courses and providing for the better discharge of the water from the central and eastern sections by gravitation into the river.
- The removal of the old boundary-posts, and making good the ground.

Mr. Lloyd moved the following amendment:—

"That until the Council has had several years' experience in these marshes, it is not in a position safely to judge whether the erection of an embankment (a mile in length) along one side of the course of the River Lee, and the formation of new flood-water channels on an extensive scale are, apart from the serious cost, desirable in themselves, changing as they would materially the natural condition and features of this extensive open plain, and the Council is further of opinion that only minor improvements, such as removing the old boundary stones, opening the surface gutters, and some slight surface levelling should be at present proceeded with. That for these reasons the recommendation of the committee be referred back for further consideration."

Mr. Reed seconded, but the amendment, on a show of hands, was declared lost. The recommendation of the committee was then agreed to.

**Use of Hydrants for Flushing Purposes.**—The Fire Brigade Committee reported as follows in reference to the use of hydrants for flushing purposes:—

"We reported on February 6th that we had given instructions for a circular letter to be addressed to the forty vestries and district boards inviting an expression of opinion on certain questions which were raised on the occasion of the conference with the representatives of local authorities on the subject of the use by such authorities of fire hydrants for flushing and other purposes. The points submitted for consideration related principally to the proportion of the cost of providing and maintaining hydrants to be borne by the local authorities, to the question of the authority on whom liability would rest in the event of damage resulting from such use, either to the hydrants themselves or to adjoining property, and to the arrangements to be made to insure that mud and rubbish should not be swept into the sewers whilst thoroughfares were being watered. Of the thirty-eight authorities who have replied, twenty-seven either express the opinion that it is not desirable that fire hydrants should be used by local authorities, or intimate that they do not wish to take any action in the matter. Some of these local authorities content themselves by suggesting that as they are simply purchasers of water from the water companies there is no need, so far as they are concerned, for any alteration in existing arrangements. The remaining eleven replies are to the effect that local authorities should be allowed to make use of hydrants, either by their workmen or

servants of the water companies, but only five of them think that they should make any payment to the Council in respect of the accommodation. The clause in the Council's General Powers Bill dealing with the question is permissive, making it lawful for the Council, the water companies, and the local authorities to enter into agreements with respect to the use of hydrants for other than fire purposes, and although, as will be seen from the above, it is not likely that many local authorities will seek to use the hydrants, it will probably be well for the Council to have statutory authority to enable it to acquiesce in such use. At present we are unable to submit any recommendations to the Council on the subject."

The Council adjourned soon after 7 o'clock.

ARCHITECTURAL ASSOCIATION  
VISITS.

A VISIT arranged by Mr. E. Woodthorpe was paid last Saturday to Inigo Jones's "Banqueting House" in Whitehall, till recently used as a Chapel Royal, and now given over to the Royal United Service Institution, and the additional building in course of erection on the south by Messrs. Aston Webb and Ingress Bell. The party were met by Mr. Ingress Bell. The Banqueting House was first visited, and being now cleared of the pews and fittings makes a very noble interior, very suitable for the purpose of a museum. It has a gallery all round 28 ft. from the floor supported on oak brackets. Just below the ceiling is a frieze in gesso and gilding, similar in detail to that outside, and Mr. Bell drew the members' attention to the fact that it was so flat as to appear to be only painted. The panels of the ceiling are filled in with oil paintings on canvas executed at Antwerp by Rubens. The new electric light fittings are in copper, and are very unobtrusive, and hardly noticed until looked for. Below is a vaulted crypt, now cleaned out and plastered, and well lit in spite of the smallness of the windows on either side. It is divided into three aisles by brick piers, receiving the main arches, which contain the groined vaults. These piers now have a wooden dado, formed of the old pew panelling of the chapel above. The guns and other heavy articles are to be exhibited here, being brought in at the back by a doorway on the street level. Two stories of the new wing are included in the height of the gallery of the chapel, at which level there is a new door of communication. The lecture-theatre, however, is the full height; it is placed at the back and has a steel roof, umbrella-like, with central ring uniting the radiating girders, two girders only crossing through it. A ring girder also unites the wall ends of the girders, preventing any thrust. The polygonal end of the theatre was partly dictated by the desire of obtaining a view of the banqueting house as seen from Whitehall Gardens. Over the theatre is placed the reading-room and library, which will also be a lofty room with galleries on an iron framing.

The building is fireproof throughout, Fawcett's flooring being used; the ventilation being effected by trunks in the floor taken into an air-shaft fitted with a hot-water radiator, which creates a steady upward draught.

The building is faced with Portland stone. The cornice at the top being proportioned to the whole building, and the surface of the wall being kept free from channellings, a certain amount of breadth from which tends to somewhat minimise the dwarfed appearance of the building in conjunction with Inigo Jones's work.

The party then proceeded to the New Admiralty Extension alongside the Horseguards' Parade, where Mr. Leeming and Mr. John Taylor received the members. The original scheme of Messrs. Leeming & Leeming for the War and Admiralty buildings, selected in open competition by Messrs. Ewan Christian & Hardwick, was abandoned, and the present building is a modified copy of the existing Admiralty, which is to form one side of the quadrangle, the fourth side (to the Parade) being an open double colonnade. Mr. Leeming, who was most obliging in freely furnishing information on every point, informed the members that the new part might be described as the old building, which consists of offices divided by a central corridor, cut in half, the halves being separated by an open area, 25 ft. wide; there are thus two corridors, each 9 ft. 6 in. wide, either side of the area, connected at the ends where the messengers' room is placed, and at the centre by a passage through the lavatories. The lavatories are separated horizontally, so that a sort of clearstory is formed to the central passage and a cross current of air obtained. On



the top floor in the roof the corridor is reversed and the rooms face each other across the area, they have thus level ceilings, the corridor being formed in the slope of the roof towards the park and lighted by dormers.

The two lowest stories are used for storage of papers, repositories being also formed under the central area with top lantern lights. The foundations attracted much attention, the cost being £22,000, and they practically consist of a sort of concrete tank, asphalted outside, the bottom being from 8 ft. to 6 ft. thick, and the sides from 7 ft. to 3 ft. butting. The bed of a branch stream to the Thames was met with, and much pumping was required; a sumpt is now provided in case of any water percolating through under the lowest floor, but it is not now expected to be required. Fireproof floors on Fawcett's principle are used throughout; channels for pipes for heating and electric wires are formed in the corridors over the same below the mosaic paving; there are dados of glazed bricks, and the central area is lined with them, the windows having dressings of yellow faience. The exterior is faced with Fareham bricks and Portland stone from the Whitbed.

### THE INSTITUTE OF BUILDERS (INCORPORATED).

#### ANNUAL MEETING.

THE tenth annual general meeting of this Institute was held at the offices, 31 and 32, Bedford-street, Strand, W.C., on the 6th inst., the chair being taken by the President, Mr. Frederick J. Dove.

The Secretary, Mr. R. S. Henshaw, read the accounts, and the following report of the Council was received and adopted:—

"1. The Council, in presenting their tenth annual report, regret to have to record the death of two members of the Institute, Mr. William A. Colls and Mr. Robert Dennett, the latter being the President of the National Association of Master Builders of Great Britain.

2. The Council have had under their consideration the following subjects:—

- (a.) Plumbers' Registration.
- (b.) Employers' Liability.
- (c.) Conspiracy and Breach of the Peace.
- (d.) Hours of Labour.
- (e.) Notice of Accidents.

With regard to the first-named, Mr. Lees Knowles, M.P., who was in charge of the Bill, promised to take the necessary steps to include the Institute as one of the various bodies from among whom members of the proposed General Council on Plumbers' Education and Registration may be co-opted.

With regard to the Hours of Labour and Notice of Accidents Bills, the Council presented petitions against them, the latter being subsequently withdrawn.

As the Conspiracy and Breach of the Peace Bill will probably be favourable to employers of labour in the event of strikes, no action was taken. Members are aware the Employers' Liability Bill, after passing the House of Commons, was sent back by the House of Lords with various amendments which when the Commons disagreed, and they sent the Bill up again with their reasons for disagreeing. It was then returned to the House of Commons with amendments favourable to freedom of contract, and dropped by the Government.

3. The Council have also had under consideration the London Streets and Buildings Bill, to which, unless clauses less unfair to the trade are inserted, the Institute will have to enter their most strenuous opposition.

4. The proposed Conditions of Contract, which have now been for upwards of five years the subject of negotiation with the Royal Institute of British Architects, has been settled, but the Committee empowered to deal with the subject held a conference with the representatives of the Royal Institute of British Architects on the 22nd ult., when several of the outstanding points were discussed, and they hope that the remaining points may shortly be adjusted.

5. The Council have, in accordance with the provisions of the articles of association, made regulations as to the election, admission, and rights of associates or honorary members, and copies can be obtained on application.

6. The Council have the pleasure to present the annual report of the Treasurer, Mr. J. H. Jones, and benevolent funds for the year 1891.

It is a pleasure to record the recognition of the fact of a new departure in the further education of young men in the various building trades. The Carpenters' Company has acquired at great expense very convenient premises in Great Titchfield-street, and have established technical classes. They invited the co-operation of the Tilers' and Bricklayers' Company, which has also opened a class. It

is hoped that the Paperstainers and Plasterers will eventually join in the work. There is a sense of this education, and the Council congratulate the City Guilds on the important step they have taken.

8. In accordance with the articles of association, the President, Mr. F. J. Dove; one of the vice-presidents, Mr. Joseph Hill; the treasurer, Mr. George Plucknett; one of the auditors, Mr. H. I. Sanders; and four members of the Council:—Mr. J. H. Jones, Mr. Benjamin Hannen, jun., Mr. Wm. Scrivener, and Mr. Jos. C. White, retire, but are eligible for re-election.

The following officers were then elected and re-elected:—President, Mr. Robert Neill, jun. (Manchester); vice-presidents, Mr. George Hayward Trollope, and Mr. Wm. Shepherd; treasurer, Mr. George Plucknett; members of the Council, Messrs. John Greenwood, Henry Holloway, William F. King, Richard Thorn, William Titmas, and Samuel Wheeler (Reading); auditor, Mr. H. I. Sanders (Southampton).

A cordial vote of thanks was unanimously tendered to Mr. Frederick J. Dove for his services as President during the past year.

### PROVIDENT INSTITUTION OF BUILDERS' FOREMEN AND CLERKS OF WORKS.

#### ANNUAL DINNER.

THE annual dinner of the donors, subscribers, members, and friends of this Institution was held in the Venetian Saloon of the Holborn Restaurant on Saturday evening, March 3, Colonel Stanley G. Bird, presiding, being supported, amongst others, by Messrs. T. R. Rider, Howard Colls, W. Scrivener, Jas. Randall, H. H. Bartlett, and Henry Holloway.

The toast of "The Queen, Prince of Wales, and Royal Family" having been duly honoured, Mr. Adams proposed the toast of "The Builders."

Mr. Howard Colls, in responding, said that he, and he was sure he might speak for his brother-builders, took a great interest in that Institution, since it was one which did a great deal of real good. He supposed there could be no more responsible business than a builder's, for his work lasted a years, and any life in it was not to be discovered, and it was, therefore, most important that his work should be done well. The feeling of a builder towards his foreman was, he thought, this: the builder wanted the foreman to see, not that the men were sweated, not that they were driven, but that they did a fair and honest day's work, and did it well. He (the speaker) believed that the majority of working men were quite willing to do their work honestly and well, but unfortunately workmen were being taught that the less they did the better for their class. He thought it was one of the greatest evils which existed between capital and labour was the doctrine of idleness which was preached in certain quarters to-day, and that was the worst of evil doctrines, for idleness could never be prosperous to anyone.

Mr. T. Rider having also responded, Mr. Groome proposed the toast of "The Governors, Trustees, Donors, Honorary Subscribers, and Visitors," coupled with the name of Mr. W. Scrivener, who replied.

The Chairman next proposed the toast of the evening, "The Provident Institution of Builders' Foremen and Clerks of Works." He said he might compare a builder's foreman to a non-commissioned officer of the British Army, since in both cases they were elected from the rank and file of their respective callings on account of their intelligence, steadiness, and various other good qualities. It was often remarked, with a good deal of truth, that it was only one step from the position of a builder's foreman to that of a builder; but seeing that the number who could rise from the ranks was necessarily limited, and that in the great struggle to achieve success many must fail, he thought he might appeal to them to support that Institution. He thought that they might point with a great deal of pride to the success of their Institution. Their last report showed that they had, in their first year, eleven members, so that in two children, and that the amount of money which had been subscribed by the members towards the pension fund was 203s., while they had distributed a sum of 309s. They had 5,200s. invested, but their object was to increase that sum so that the position of their Institution might be made secure. They had 114 members, but in that connexion he might remark that there were present that evening 376 gentlemen; many of whom were therefore not members. The subscription was £2 a year, or

less than a shilling a week. He could count the Institution to clerks of works quite as steady as he could to builders' foremen.

Mr. J. W. H. Bedford replied, and, in course of his remarks, he stated that the Institution had been in existence fifty-one years, that during that time they had disbursed 9,800s.

Other toasts were "The Chairman," proposed by Mr. W. H. Sharplington; "The Press," proposed by the Chairman and coupled with the name of our representative, and "The Stewards," also proposed by the Chairman, and responded by Mr. W. H. Sharplington.

During the evening subscriptions and donations to the amount of 106s. 10s. 6d. were announced, included in which was a donation by the Institution of 10s.

### ARCHITECTURAL SOCIETIES.

LIVERPOOL ARCHITECTURAL SOCIETY.—The sixth ordinary meeting of the forty-sixth year of this Society was held on Monday, at the Library, Union-court, Castle-street, Mr. V. Keefe occupying the chair. A paper was read by Mr. James H. Cook, of Liverpool, on "Years' Architectural Life in America."

YORK ARCHITECTURAL SOCIETY.—On the 1st inst. Mr. E. T. Felgate read a paper before the Society on the "Chicago Exhibition."—A day's exhibition of the prize competition drawings from the Royal Institute of British Architects, London, has been held in the Saloon of the Art Institution, York, this week, under the auspices of the York Architectural Society. NORTHERN ARCHITECTURAL ASSOCIATION.—A meeting of the Northern Architectural Association was held on the 28th ult. in the museum, Art Gallery, Newcastle. Mr. M. President, occupied the chair, and there was good attendance. The hon. secretary (Mr. Plummer) read a paper on "Zinc and Leadings," which was illustrated by sections, models, and diagrams. In the course of the paper Mr. Plummer said he was of opinion good zinc, properly laid on, was less liable to defects than most other roofing materials; he believed the best zinc was that manufactured by V. M. and Co. of America.

DEVON AND EXETER ARCHITECTURAL SOCIETY.—The third annual meeting of this Society was held in Exeter, at the Rough Hotel, on the 27th ult. After lunching at the hotel, the members visited the various places of interest. The party was composed of Messrs. Harry Hems & Sons' studio, Longbrook-street, where the various drawings, plans, and models were shown, and a floor, all worked by a powerful gas-engine, was seen. At St. Andrew's Chapel, Almshouses Mr. F. J. Condon described the place. A visit was afterwards paid to the House, which was described by Mr. J. Crocker. The law library, the Deanery, and the various places were described by Mr. Jas. Jerman. By the kindness of Mr. Marriott the society also inspected some of the buildings in the Close. The annual meeting held in the Cathedral. The President, Mr. J. Crocker, occupied the chair. The report of the previous year was adopted. Mr. J. Jerman was elected President, Mr. C. E. Crocker, Vice-President, and the following were elected Council: Messrs. J. J. Condon, J. C. J. M. Pinn, A. Thorne, C. J. Tait, Treasurer, E. G. Warren (Hon. Sec.).

GLASGOW ARCHITECTURAL INSTITUTE.—At a meeting of this Association, held on the 28th ult. Town Hall, Mr. S. W. B. Jack gave a lecture on "Some of Our Scottish Architecture," which was illustrated by a number of limelight lanterns. The lecture was commenced by illustrations of the ruins of some of the existing examples of Scottish architecture which were built prior to the twelfth century; and proceeding, then, to the ruins of the famous buildings during the subsequent centuries up to the present time, he pointed out the growth of decorative principles peculiar to Scottish architecture, and the influence of the introduction of foreign ornamentation and ideas, which had been brought over by the Scottish architects during their intrigues with Scotland. In the course of the lecture, Mr. Jack described, in detail, Dunfermline Abbey, the earliest Norman edifice in that country; Kelso Abbey; Glasgow Cathedral, with its unrivalled crypt built in the thirteenth century; Melrose Abbey; Roslin Chapel; and the palaces of Linlithgow and Falkland, illustrating the solidity of the S

onial style; also Heriot's Hospital, Edinburgh, examples of the employment of Roman detailing. The works of this century shown were those of the New Municipal Buildings, Glasgow, the General Post Office and Free Library Buildings, Edinburgh. A vote of thanks to Mr. [unclear] concluded the lecture.

**DUNDEE ARCHITECTURAL ASSOCIATION.**—The first visit of the present session of the Dundee Architectural Association took place on the 24th ult., to Craighouse Asylum. Dr. [unclear] and Mr. Sydney Mitchell were the members of the party—the former dealing with the medical aspect, the latter describing their main architectural features. Dr. [unclear] explained that in old times the idea of asylum for the insane was a prison. The sole notion was detention, and all architectural considerations were subservient to that of keeping the patients safely. During the last fifty years, however, a great change had taken place in the idea of asylum architecture. It had been altogether revolutionised. Medical experience had proved that a great number of the insane did not require these extreme restrictions; in fact, it was proved that more than half the insane did not need them at all. It was found that a man's surroundings and conditions of life immensely influenced his state of mind. Therefore, the principle was got hold of to make the institution the right hand of the doctor, and that principle has been carried out. In order, however, to carry it out they had to keep in mind the enormous variety of the forms of mental disease. A study showed that it was better to have a variety of architecture, that almost each variety of mental disease should have something suitable to itself. The house required to be adapted to its inhabitants, and that principle has been carried out pretty well of late years. An asylum, therefore, should contain all the characteristics of an hospital in some of its parts, of a home in others; and both aspects were to be mixed up together. They required shelter to make provision for the changes that a patient might pass through as his condition improved. It had an immensely healing influence to remove a patient from association with all that reminded him of the worst stage of his disease. In fact, all restrictions came to be abolished except those which were absolutely necessary. With regard to the Royal Asylum, it was decided to provide for half the patients distinct houses like private dwellings, and to have a large centre for administration, for amusement, for food, for exercise; and this scheme had been carried into effect. The centre of the establishment was a great hall like the hall of an English noble mansion, where everybody met together, into which every part of the house opened. There were, he explained, different classes of wards, so that a patient progressing towards recovery might be removed from one to another, where he had not the associations of his previous and the mental impression he got in the old. The kind of impression they wished to produce, he said, was one of cheerfulness, of fresh air, of bright colour, and attractiveness.

**DUNDEE INSTITUTE OF ARCHITECTURE, SCIENCE, AND ART.**—The second ordinary meeting of the Dundee Institute of Architecture, Science, and Art for the present session was held on the 1st inst., when the members and associates had an opportunity of inspecting the electric lighting station in Dudhope Crescent-road. There were about 150 present. The visitors were first taken to the testing-room. Proceeding to the engine-room, the party had an opportunity of inspecting the generating machinery, and the working of the regulating apparatus and switchgear were explained by Mr. W. H. Brownlee, an electrical engineer. Concluding, the members were shown the boilers and the accumulators.

#### ENGINEERING SOCIETIES.

**THE INSTITUTE OF CIVIL ENGINEERS.**—At the ordinary meeting of this Institution on the 1st inst., Mr. J. Wolfe Barry (Vice-President) in the chair, it was announced that eleven Associate members had been transferred to the class of members, and the twenty-nine candidates had been admitted as Students. The monthly ballot resulted in the election of two Members, and thirty-five Associate Members.

**THE CIVIL AND MECHANICAL ENGINEERS' SOCIETY.**—A paper was read before this Society on the 1st inst. by Mr. J. F. Reade, on "The Applications of Water Power." The author commenced by dealing with the principal matters requiring attention in the preliminary investigation

as to the power to be obtained from any stream that it was proposed to make use of for obtaining power. He then proceeded to describe various machines employed in utilising the power to be obtained from water, among them being the "Undershot Water Wheel," the "Breast Water Wheel," the "Overshot Water Wheel," the "Pitchback Water Wheel," the "Pelton Wheel," and various turbines. At the conclusion of the paper a discussion ensued, the following gentlemen taking part therein:—Messrs. E. H. G. Brewster, C. T. Walrand, H. J. Fereday, H. Coward, F. Spark, E. Perrett, W. Cooper Penn, J. O. Ince, J. Taylor, S. A. Court, and S. Turner.

**THE JUNIOR ENGINEERING SOCIETY.**—On the 24th ult. the Tottenham and Forest Gate Railway Works were visited by the members of this Society, a party of about 100 being present. To facilitate the inspection, a train of wagons, kindly supplied by the contractors, Messrs. Lucas & Aird, conveyed the party from one end of the line to the other, stoppages being made en route to examine the numerous features of interest. The railway, which is about six miles long, forms a connexion between London and the Midlands. Starting at South Tottenham by a junction of the Tottenham and Hampstead Railway, it passes through Walthamstow, Leyton, Wanstead, West Ham, and East Ham to Forest Gate, making a junction there with the Tilbury line. Included in its length are seventy-two steel bridges, in the construction of which 4,000 tons of Siemens-Martin steel have been used. Of these bridges fifteen are over and fifty-seven are under, and of various types and spans, no two being alike. The line for about half its length is carried on embankment and in cutting, and three miles of it consists of a viaduct of brickwork, arches of 30 ft. span. The amount of the contract is 264,422*l.*, exclusive of station buildings. The engineer is Mr. Arthur C. Pain, whose representative, with Mr. Jackson and Mr. J. G. T. Browning representing the contractors, showed the members over. The latter has had charge of the diversions of sewers, roads, &c., and has, we understand, now been appointed resident engineer for the Eastwood and Greasley drainage scheme in the county of Nottingham. Before the party dispersed, their thanks for the arrangements made were expressed by Mr. P. J. Waldran, the Chairman of the Society.

**SOCIETY OF ENGINEERS.**—At the meeting of the Society of Engineers, held at the Town Hall, Westminster, on the 5th inst., Mr. G. A. Goodwin, President, in the chair, a paper was read by Mr. Henry O'Connor on "Pile Driving." The author having remarked upon the difference in the formula suggested by different engineers for calculating the weight required to sink a pile further in the ground, exhibited a diagram giving the result of these calculations for two piles, which showed that by one formula only 72 tons would sink the pile further, whereas by another formula it would take 300 tons. This great difference was accounted for by the various strata of the ground through which the pile was driven, and which the author said was not sufficiently allowed for, and showed a system which he had adopted of finding out the resistance of each layer of the ground, and the force required to withdraw a pile. The author then went on to describe the steam pile driver used to drive the piles which afterwards had to be withdrawn, and then touched upon the breaking load of a pine pillar, and the side pressure, which would be exerted at the moment of impact, and the method of obtaining the resistance of the ground, which would be offered to the pile when it had been driven home. The author next mentioned some experiments he had made on the force of the blow, from a monkey falling different heights, and pointed out that the friction against the guides of the pile-driver reduced the blow which the ordinary calculation for a falling weight would indicate. The author described the difficulty which had been recently experienced at Becton, in getting a large number of cast-iron piles to stand a specified test, and showed various shoes for fitting on the bottom of the piles to prevent them sinking through the thin stratum of ballast which was found there, he then pointed out the shape which the pile was afterwards made, and which had the desired effect; he then passed on to the effect which the interposition of a hard wooden dolly had upon the blow given by a falling ram, and showed the results of certain experiments to ascertain the loss of effective blow upon the pile. He then gave the result of a test load placed upon a cast-iron pile, which he had driven to a test of  $\frac{3}{4}$ -inch, set for four 5-ft. blows of a one-ton ram, and showed a sketch of a continuous action steam pile

driver used to drive a large number of cast-iron piles. The author then mentioned the enormous blow given in America, when driving a large number of piles, and the effective blow which the pile would receive at the moment of impact, the large blow causing many of the pile tops to crush. The author having stated what he would consider as a safe load on a wooden pile driven in such strata, as he had already mentioned, as that in which a very large number of piles had been driven under his superintendence, showed a diagram which he had recently got out, and which was the result of an enormous number of calculations, by which the safe load on unsupported cast-iron columns might be easily and rapidly found. The author, in conclusion, gave some comparative figures as to the cost of driving a wooden pile, a cast-iron pile, and making the smallest workable excavation and concreting the same, showing that the cast-iron pile cost about three and a half times as much as the wooden one, while the excavation cost about eight times as much.

## Correspondence.

To the Editor of THE BUILDER.

UNIVERSITY COLLEGE, LONDON.

SIR,—Referring to an editorial note in the last *Builder*, I am quite ready to admit (having had the matter tested) that the determination made for you of the axial line of University College Buildings by Professor Adams is, for practical purposes, correct. But I beg to add that the conclusion drawn that, if my plans are carried out, the proposed interspace would be so absurdly small, as has been stated, does not follow.

I was misled by a block-plan made for me by a draughtsman who, though experienced and careful, laid down the position of the lodges wrong; but I hope it is not necessary for me to add that neither my son nor I had, on the 26th ult., the least suspicion of the mistake; and we both regret if it led to any remark being made of which you complain. Perhaps that notice had been avoided had we had any sort of notice beforehand that the point would be raised.

T. ROGER SMITH.

March 7, 1894.

\* \* \* Testing the plan by scale again, we find there is 2 ft. more to allow. Professor Adams's measurement from the axial line to the first break in the wall of the new building is 62 ft. 1½ in. From that break to the projection of the semi-circular porch, by scale, in Professor Roger Smith's plan, is 57 ft. leaving 5 ft. 1½ in. between that and the centre line, or 10 ft. 3 in. as the central opening between the two porches, and 52 ft. 3 in. between the angles of the main building. We can see nothing else possible unless the opening is to be out of centre with the portico, which would be worse than all.—Ed.

## The Student's Column.

THE STRUCTURE AND PHYSICAL PROPERTIES OF BUILDING STONES.—X.

THE MICROSCOPE.

**THE** class of microscope used in investigating the minute structure of rocks is called a "petrological microscope"; one suited for biological or physiological research alone is of practically no use to us. In many instances the student would find it advantageous to have his microscope made to order, depending on the kind of rocks to be dealt with, and the length of his purse.

The essential features of a petrological microscope are as follows:—In the first place it should be well made, mounted on a firm, solid stand, and capable of being adjusted at any angle. It should be built on the monocular principle; binocular microscopes are, as a rule, more suited for exhibition at conversazioni than for real scientific work. There should be both coarse and fine adjustments, the head of the latter being graduated for the approximate measurement of the thickness of sections. The lenses ought to be of the best make; cheap ones are of little use. The principal object to be attained is such a combination of the eye-piece and objective as will ensure a clear field without distortion of the image. It is advantageous for many purposes that the eye-piece should be fitted not at once into the body of the microscope, but into an intermediate tube, the drawing-out of



which, by augmenting the distance between the objective and the image, still further augments the size of the latter in relation to that of the object. For all ordinary purposes a higher power objective than one-inch is not required; but a two-inch is useful under certain circumstances. A centering nose-piece is convenient to centre the instrument for any objective; this is usually effected by two screws working against a spring on opposite sides. A slot for the insertion of a Klein's quartz plate should be cut. It is also useful essential that a good polarising apparatus, and corresponding analyser, be attached to the microscope. We may pause for a moment to describe these in more detail. A polariser is usually a "Nicol" prism of Iceland spar, so constructed as to transmit only one of the two rays into which a beam of ordinary light is made to diverge by passing through this mineral. The polarising prism is usually fitted into a tube with a large milled-head at the bottom, by which it is made to rotate in a collar attached to the microscope; this collar is generally fitted to the underside of the stage-plate, in such a manner that the whole polarising apparatus can be swung out of position when required. The analyser, which is frequently made also of a "Nicol" prism, is usually placed either in the interior of the microscope, or between the eye-piece and the eye, preferably the former, though that is sometimes inconvenient. When arranged in the barrel of the instrument it may be slid in and out at will.

We cannot pause to explain the actual optical phenomena brought about when the transparent rock section is examined in polarised light; but we may briefly give the general effect. If the student is regarding the section in transmitted light alone, as a general rule the object is brighter, and in many cases he will see a few crystals scattered about without much apparent structure in them. Half the field, shall we say, is made of white crystals. Now a very large number of minerals are white, or very light yellow, and we are consequently not able to say which of these we are looking at. But swing the polariser in position, slide in the analyser, and what a different effect. What was in ordinary light a mass of white crystals is now seen to be resplendent with colour, and where no structure was previously observable we plainly see a most elaborate pattern. By carefully carrying on our researches with different classes of rock we speedily become aware of the fact that in a general way the same minerals give us the same optical phenomena—approximately the same colours and the same pattern.

We are now in a position to understand one of the elementary methods by which the petrologist is able at sight to determine the common rock-forming minerals. We say one of the methods because there are many others. We know that most minerals have distinct planes of cleavage, and other positions, more or less symmetrically disposed. If it so happens that in slicing out transparent rock section we chance to cut it parallel with one of the planes (or positions alluded to) of a crystal, that crystal will usually present a different optical effect to when it is cut obliquely to those positions. In general, however, even the elementary student soon learns the possible effects produced by such a coincidence.

In certain cases, crystals presenting a somewhat similar appearance to each other, or similarly altered by the divers processes in Nature, have yet certain distinguishing characters, known as "extinction" phenomena. The stage of a petrological microscope is circular and so arranged as to revolve in one plane around an imaginary axis and at right angles to it, that axis corresponding to the axis of the barrel of the microscope. The edge of the circular stage is divided into 360 degrees; so also is the revolving portion of the polarising apparatus. If we revolve either the one or the other in transmitted light we notice that at a certain part of the revolution the field of the microscope becomes dark, whilst, on the other hand, at another part it becomes very light, there being a gradual diminution, or increase in light as we pass from the one to the other. If, now, we place a thin section of rock, made up of several different minerals, on the stage of the microscope we observe that in revolving the polariser the whole of the minerals do not become dark or light, as the case may be, at the same time, or same position of the revolution. Confining our attention to one particular mineral in the section, and placing it in a position of most light, we notice that in turning the stage we pass through a certain number of degrees, as read off on the divided edge, before reaching the darkest point. If we now determine the species of that mineral, and

observe the effect of the polarising apparatus on others of the same kind, we become aware that we usually pass through a certain number of degrees before reaching the darkest point or extinction angle of that mineral; and seeing that each of the commoner kinds of minerals found in rocks have a definite angle of extinction, the student will readily perceive that it is a good feature in enabling him to determine them.

Another optical property of many minerals found in building stones is known as pleochroism, which may be briefly described as follows. Some minerals show a change of colour when a "Nicol" prism is rotated below them; hornblende, for example, exhibiting a gradation from deep brown to dark yellow. A mineral presenting this change is said to be pleochroic. To ascertain the pleochroism of any mineral we remove the upper prism, and leave only the lower. If, as we rotate the latter directly under the stage of the microscope, no change of tint can be observed, no pleochroic mineral is present, or at least none which show the phenomenon at the angle at which the slice has been cut. But we may often detect in a slice of some crystalline rock little crystals which offer a change of hue as the prism goes round; these are examples of pleochroism, and are used to identify the mineral constituents of rocks.

#### GENERAL MICRO-STRUCTURE OF STONES.

Having secured a good microscope and accessories as above described, and learnt something of their use, we commence to study the micro-sections of building stones. We do not proceed far before discovering that according to their micro-structure, building stones fall into three groups: (1) The thoroughly crystalline, (2) the partly crystalline, and (3) the earthy.

The first-mentioned group, as typified by granite and statuary marble, is composed entirely of crystalline minerals which are in direct contact with one another, there being no amorphous substance, or cementing material between them. The partly crystalline group includes by far the largest number of varieties of building stone, and may be divided into several sub-groups; but we refrain for the present from defining more than two of them. (a) Volcanic rocks, like basalt and trachyte, where a number of minute crystals are embedded in a paste or ground mass of non-crystalline material, and (b) sandstones, and many kinds of limestone where crystalline particles and organic remains are bound together by some amorphous mineral matter. The third group—the earthy—comprises a large number of the softer building stones, especially the earthy limestones.

The chief aim of the present observations on the structure of building stones is to point out certain features whereby each kind may be readily recognised; and to pave the way for a proper understanding of this it is necessary first to briefly describe the optical properties presented by the common rock-forming minerals when seen in transmitted light, and under the polariscope. The external appearance of these minerals was described in the last series of articles in this column,\* and need not be further referred to.

#### MICRO-STRUCTURE OF MINERALS

**Quartz.**—This mineral, one of the most common of rock formers, and an essential constituent of many of the best-known building stones, occurs in a variety of ways, but presents constant characters under the polariser. In granites it is generally seen as rather large clear crystals, presenting bright colours—yellow, red, blue, &c.—as the polariser is revolved. Lines of extremely minute dots (really cavities) often run in general directions over the crystals; the latter being irregular in shape. In rocks like sandstone, we observe the same polariscopic effects on the quartz, but the mineral, instead of existing as regularly defined crystals, or irregularly filling up spaces, is seen as fragments; in fact, the sand constituting the bulk of the stone mostly consists of broken-up grains of quartz. In shelly limestones, and oolites, quartz sometimes occurs as patches made up of very minute (finely-divided) crystals, and distributed in the matrix, binding the various ingredients of the stone together; or, in certain varieties of the same stone it may also occur as isolated sand grains.

Quartz and its allies, chert and flint, have a special interest attaching to them from an architectural point of view, and the student is requested to carefully study the group under the microscope. Not long since, we heard it declared by a leading architect, that "the more silica (quartz, flint, &c.) building stones contain the better they withstand

the action of the weather"—a remark which is most elementary student of their micro-structure will know to be entirely unfounded on facts. There are two principal kinds of felspar, for example, frequently shows a small percentage of silica, in fact that silica formed the matrix of the stone) grant that it would materially preserve it atmospheric effects; but if it were present only in small grains, distributed here and there (most frequently the case) it could not lend the slightest support in that respect. The presence or absence of quartz sand grains is taken to be a distinctive feature in the recognition of varieties of building stone otherwise very similar in micro-structure. The beautifully transparent and brilliant colours, passing gradually into other as the polariscope is revolved, serve to distinguish this mineral from all others.

**Felspar.**—There are many varieties of felspar, but as they enter more particularly into the structure of igneous rocks, whilst we are only concerned, except in a general way, with aqueous, they need not be alluded to in any detail. There are two principal kinds of felspar—orthoclase and plagioclase. The former is a constituent of many acid rocks, and in polarised light under the microscope the crystals sometimes exhibit moderately strong colours. Many of the crystals are twinned, showing different tints on either side of a line running through them. In general, orthoclase crystals have not much of a structure except that in some cases they are cut up and altered, and dotted all over with minute spots. Plagioclase crystals are a rule much smaller, and commonly found in the basic class of igneous rocks. They are frequently seen as small lathe-shaped crystals, and under the polariscope present an apparently striated appearance.

#### GENERAL BUILDING NEWS

**A NEW "BATHS CLUB."**—A club under this name is being formed for the purpose of affording its members opportunity at all times of the year for recreative exercise under cover, especially in cold weather, and for Turkish, Roman, and other baths. Buildings are being erected on a site in Mayfair with entrances in Dover-street and Berkeley-street at a cost of 70,000*l.*, and are expected to be ready about June 1. The Bath Hall will contain swimming-pool, 75 ft. by 35 ft. The architect are Messrs. Young & Spencer, of London.

**ADDITIONS TO PETERBOROUGH CATHEDRAL.**—According to the *Morning Post*, May 10 has been fixed for the dedication of the following additions made to the choir of Peterborough Cathedral, the total cost of about 9,000*l.*:—(1) The new organ case, which has cost 4,400*l.* (2) The canopy over the choir, which has cost 1,300*l.* (3) The reredos. (4) The iron screen enclosing the four eastern bays of the choir. (5) The enlargement of the foot place and the extension of the marble pavement of the choir. (6) The pillars and entrance gates to the choir. (7) The fourteen sub-stalls, with book boards and ironwork. (8) The stalls with canopies. (9) The altar rails. (10) The credence table. The erection of the new works are appealing for funds to carry out the works certified by the architect, Mr. J. Pearson, R.A., to be urgently required for the safety of the fabric. These works are:—(1) The extension of the masonry of the north and south transepts, such masonry being in many places insecure. (2) The underpinning and repairs to the north-east angle of the Eastern Chapel. (3) The erection of scaffolding to enable the architect to make a careful examination of the west font. The total estimated cost of these works is 4,000*l.*

**RESTORATION OF WINTERBORNE ABBEY CHURCH, DORSETSHIRE.**—On the 24th ult. the Parish Church of Winterborne Abbas was re-opened after renovation, by the Bishop of Salisbury. When completed, the work of restoration will have cost little short of 1,000*l.* A part of the restoration is the efficient drainage of the church, which is before very damp. The outside walls of the choir and tower have been thoroughly repaired and stones pointed. Within the building the plaster has been scraped off the walls and the stonework brought to sight and repointed. The windows have been reglazed, and a new wooden roof has been put in throughout the church—nave, chancel, and tower. There was before a plain plaster ceiling but the roof was deemed too good to be removed and so the new wooden roof was put in beneath it. The roof is of Kerry pine; it is in a perpendicular style, with panels, and being raised in Kerry pine, but only the north aisle has been done as yet. The gallery in the north aisle bearing the date 1707, has been allowed to remain. The architect is Mr. J. Reeve, of London. The stonework was done by Mr. Bartlett, builder Shipton Gorge; the woodwork by Mr. Haywood, carpenter, of Burton Bradstock; and the glazing the windows by Mr. Sladder, of Bridport.

\* See *Builder*, vol. lxxv. (1893), p. 88



PERSON OF THE CARDIFF FREE LIBRARY. The 28th ult. the memorial stones of the extension of the Cardiff Free Library in the Hayes were laid. New buildings will cost about 15,000l., and are erected by Messrs. E. Turner & Sons, Ltd., from plans designed by Messrs. Seward & Tristram. The entrance to the new structure will be Trinity-street, near the entrance to the existing building. Immediately inside, on the right, is the reading-room, a space of over 500 square yards, the floor being 10 ft. above the floor. A short corridor about 10 ft. wide, leads to the ladies' reading-room. The borrower's hall of the lending library joins the reading-room. The whole of the ground floor of the building has been devoted to the lending library. It will be book storage on the ground floor of the existing galleries for 45,000 volumes, with a reserve of 10,000 volumes. The reference library will be on the first floor, and will be approached by a staircase 9 ft. wide, immediately inside the principal entrance. The new reading-room will occupy a space about the size of the news-room, there being a storage for about 35,000 volumes, and arrangements are included in the building for a gallery of the alcoves which will double the accommodation. When required, a second gallery will be added to the book storage space, and ultimately the rooms now occupied by the reading-room and holding library books. The new library reading-room is lighted on three sides, as in the news-room below, and also by some night-lights in the roof, these being also available for ventilation. The total height of the reference library ceiling is about 32 ft., there being a large alcove several feet higher. The basement will be utilised for the storage of bound newspapers, and for binding and repairing rooms, mess-rooms for students, lavatories, and heating apparatus, there being besides a space underneath the news-room in extent to the size of the room itself, this is designed for the storage of specifications of books, and which will be available for other purposes for some time to come. The caretaker, and of being accommodated in the basement, as the present, will have rooms provided for him at the end of the existing building on the first floor. The facings of the building will be of Corsham Bath stone, with Newbridge stone backing, the staircases will be constructed of York red steps.

HOSPITAL, ILKESTON.—Lord Belper opened a hospital at Ilkeston a few days ago. The architect was Mr. Charles W. Hunt, of Ilkeston. Mr. E. Shaw, of Ilkeston, has been the contractor, and the plumbing work has been carried out by G. Andrew, of Ilkeston.

CO-OPERATIVE PREMISES, CARNFORTH.—A large lot of buildings has just been completed at Carnforth for the Co-operative Society, which consists of a double-fronted draper's shop, with fitting and retelling room, and three show rooms; a confectioner's shop, secretary's office, committee room, a large bakery. The walls are lined with white bricks, and a fireproof ceiling. There is a workshop for the bootmaker, three large warehouses, and a store throughout. The front is finished with free-dressings and Yorkshire parpouts; the roof is covered with green Westmoreland slates and iron ridging. The building is designed in harmony with the existing premises built about six years ago. The whole of the work has been carried by local contractors from the designs, and under the superintendence of Mr. Robert Walker, architect, Windermere.

#### FOREIGN AND COLONIAL.

FRANCE.—The Achille Leclère prize in architecture has been awarded by the Académie des Beaux-Arts to M. Adrien Rey, pupil of M. Laloux. The prize painters who have been selected for the final competition for the decoration of the Mairie de Boulogne MM. Louis Bérond, Rachon, and Pierre Chéret have completed their full-sized cartoons, which are now on view at the Hôtel de Ville at Paris. The jury in the competition for the first premium to MM. Chéret, of Paris; the second premium to M. Schmit, of Paris; and the third to MM. Emile Leclère and Morin-Goustiaux. More than a hundred architects took part in the competition.—M. Albert, the architect who carried out the restoration of the Bastille and Rue St. Antoine for the 1889 Exhibition, has applied to the Municipal Council for the restoration of the restoration of the celebrated tower of the Moorish Kings of Granada.—A Parliamentary Committee is appointed to consider the question of a maritime canal from Paris to the Atlantic.—The Ministerial Council has approved of a project for authorising the Paris Municipality to construct a subterranean tubular railway from the Bois de Boulogne to the Bois de Vincennes.—M. des Fréminet, a distinguished member of the Paris Press, has been appointed Curator of the Egyptian Museum.—M. Picard, the Commissioner General for the 1900 Exhibition, has been asked to favour a preliminary scheme for a public exhibition of athletics. This is to include the complete restoration of the Altis at Olympia, the temple of Zeus, the Heronion, &c., while the restored

stadium and hippodrome will be the scene of contests imitated from antique practice. Beyond the limits of the Altis, Roman baths would be constructed on ancient models.—The Central Pavilion of the exhibition which is to open at Lyons on April 26, will be larger than the Galerie des Machines on the Champ de Mars. It is a large regular polygon of 234 mètres radius, and is erected on the Tête d'Or park. Around this central building are walks and plantations, interspersed with minor structures in imitation of various styles and dates.—Important works are to be undertaken at Lyons to protect the quays and passenger piers from the inundations of the Rhone.—At Tunis a society is to be formed, under the title of the "Institut de Carthage," to take note of and publish the various archaeological discoveries which are constantly being made on Tunisian territory.

GERMANY.—The Municipal Council have appointed a committee to confer with Messrs. Siemens & Halske, who have applied for the contract for the construction of the proposed Berlin electrical railways. In view of the fact that the present tramway concessions expire in 1911, it is proposed to appoint a permanent committee for "Communications." Engineer Immeckenberg has submitted his plans for the construction of an electrical railway to pass under the Spree between Stralow and Treptow, both popular suburbs of Berlin.—The district of Teltow is to have a new hospital with 150 beds, at a cost of about 23,000l.—The invitations to the proposed congress of the Lutheran clergy and church architects has now been issued by the *Vereinigung Berliner Architekten*. The meetings are to be held at the historical "New Church" on the Gensdarmen Platz on the 28th and 29th inst. A small exhibition of church architecture will be held in connexion with the congress.—Ulm is to have a new Assembly Hall, and a competition has been opened for the design. There will be a jury of seven, and 180l. will be given in premiums.—The commissioners for the Roman Limes investigations in Bavaria was last year engaged in tracing the course of the Limes over the Tulzach valley between Dennenlohe and Lellenfeld. Many fine specimens of Roman *terra sigillata* vases were discovered in the course of the necessary excavations.—The provincial diet of Hanover has resolved to connect the Rivers Ruhr and Lippe with the new Dortmund-Ems canal, and render them navigable up to their respective junctions with the canal.—Some particulars as to the proposed Elbe-Trade Canal have been made public by Herr Rehder, of Lübeck, the designer, at the recent meeting of the Union for the Advancement of German River and Canal Navigation. The total length is to be 67 kilometres, with three locks towards the southern, and six towards the northern end, the high-level reach being 27 kilometres long. The locks will be 100 metres in breadth, whilst the normal breadth of the waterway will be 32 metres at the surface and 22 metres on the bed. The total cost involved is estimated at about 1,140,000l.; the financial preliminaries have now been satisfactorily settled.—No less than one hundred and twenty-nine designs were submitted for the Elberfeld Town-hall competition. Herr H. Seeling's design was considered the best, but too expensive, and hence *hors de combat*. Three premiums of 250l. each were given to Messrs. Rossbach (Leipzig), Reinhardt (Berlin), and Polster & Hohne (Leipzig). A number of minor premiums were given, and Herr Seeling's design was "bought" for 50l.

SWITZERLAND.—The competition for designs for the provisional buildings of the proposed Geneva "Swiss National Exhibition" in 1896 has been decided; the first three premiums of 1200l. each falling to Messrs. Juvet (Geneva), Châble (Vieux Châtel), and Brémont (Geneva).—The new Church of the Virgin Mary at Zurich is rapidly approaching completion. Seating accommodation is provided for about 1,000 worshippers at a total cost of 340,000 francs. The building, of which the internal dimensions are 35 by 21 metres, is designed as an Italian Basilica style with the addition of a campanile. The central nave is 15 metres broad and 16½ metres high, and is flanked on either side by passages 3 metres broad, between which and the nave are twenty columns, connected by arches, supporting the roof, of which the beams are left uncovered. The architect is Mr. A. Hardegger.

#### MISCELLANEOUS.

SANITARY INSPECTORS' ASSOCIATION.—At the March meeting of this Association, held on Saturday last at Carpenters' Hall, London Wall, a lecture was delivered by Dr. Francis Vacher, Medical Officer of Health (Birkenhead), on "Physical Appearances in Sound and in Unsound Meat," Mr. Thomas (the Chairman of Council) presiding.

CITY COMMISSION OF SEWERS.—On the 6th inst. a meeting of the City Commission of Sewers was held at the Guildhall, Mr. J. C. Bell, the chairman, presiding. A deputation from the inhabitants of Upper Thames-street, asking that the thoroughfare might be paved with a noiseless material, attended, and their memorial to the effect was referred to the Streets Committee. At the instance of the Finance and Improvement Committee the sum of 3,400l. was paid for ground laid into the public way in Mitre-

street, Aldgate, and adjacent thoroughfares. The same committee submitted correspondence with the London County Council in connexion with the approaches to the Tower Bridge and various important improvements in the City. In regard to complaints from citizens and others alleging that a district surveyor had charged fees in respect of sky-signs, which were merely hanging advertisements over footways, the committee, having viewed the so-called signs, reported that they could not be so designated, and they recommended that the London County Council should be so informed, and that the surveyor should be ordered to return the fees. It was resolved to appoint an electrical inspector under the Electric Lighting Act at a salary of 250l. Dr. Sedgwick Saunders, medical officer of health, reported that 244 houses had been inspected during the week, of which 26 required sanitary improvements in various particulars.

LONDON SANITARY PROTECTION ASSOCIATION.—The thirteenth annual meeting of this association was held on the 6th inst. at the offices, 21, Great George-street, Westminster, Surgeon-General Munro, C.B., in the chair. The report showed that during the past year 488 houses had been inspected for the first time, great attention being given to thoroughly testing house drains as to their freedom from leakage into the surrounding soil. Experience showed that these drains, though free from obstruction and well ventilated, were frequently in a most dangerous condition from bad jointing, and allowed the escape of sewage into the soil beneath the house. The question of sanitation of flats had attracted the serious attention of the Association, and especially the necessity of testing the whole system of drainage with which any flat was connected before the flat itself could be certified to be in a sanitary condition. Nearly 60 per cent. of the houses inspected for the first time were in a more or less bad condition. The engineers had been experimenting with a smoke machine, which it was hoped would render the smoke tests for such parts of the drainage system as are not amenable to the water test more thorough and reliable. The chairman, in moving the adoption of the report and accounts, referred to the fact that the Association had only recently been requested to undertake the inspection of a building in the City of Rome. The report was carried unanimously, and the council and officers were also re-elected.

STATUE OF QUEEN ANNE, MINEHEAD.—The foundation-stone for the re-erection of a statue of Queen Anne has just been relaid at Minehead. The statue is to be erected in Wellington-square, close by the wall at the west end of St. Andrew's Church, under a canopy designed by Mr. H. Dare Bryan, architect, of College-green, Bristol, the work being carried out by Messrs. Trask & Sons, of Doulting, Yeovil.

A WATER EXPERIMENT IN THE CITY.—Colonel Haywood, the Engineer to the City Commission of Sewers, has laid before that body a description of the artesian well recently sunk in New-street, Gravel-lane, by the Commission, under his superintendence. It is now eight years since the Commission first resolved to take means to supply the citizens with water independently of the New River Company, their attention having then been called to the heavy charges made for water in the City. The charge being calculated on the rateable value of the premises, and not in respect of the water actually consumed, was considered unjust and extortionate. The present experiment was, therefore, undertaken, the well being sunk in Gravel-lane, immediately adjoining the immense block of artisans' dwellings erected by the Commission. The original tenders for sinking the well to a depth of 350 ft., varied from 1,350l. to 5,850l., but eventually one for 1,750l. was accepted. After two years' work, the contract had to be annulled owing to legal and other difficulties, and a fresh contract for 1,550l. was accepted with another firm. On March 3, 1890, the work was re-commenced, and in 1891 the contract depth of 350 ft. was reached. The well then yielded but 600 gallons per hour, a quantity insufficient for the supply of the artisans' dwellings, and on the advice of Colonel Haywood the boring was sunk until it reached in all about 512 ft. from the surface. The well now yields 70,000 gallons in twenty-four hours or about 3,000 gallons per hour. The cost of the work in all has been 5,610l. The water is perfectly wholesome and fit for every purpose of domestic life. All kinds of geological formations—gravel, sand, clay, rock, &c.—had been passed through in the progress of the work. The artisans' dwellings served by the new well contain 241 separate tenements and 535 rooms and 36 shops, and there is a permanent water storage capacity of 14,566 gallons by means of tanks on the roof.

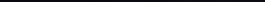
BUILDERS' EXCHANGE FOR GLASGOW.—Following on a paper recently read by Colonel Robert J. Bennett before the Philosophical Society of Glasgow on "Builders' Exchanges" as conducted in America, a meeting was held on the 5th inst. in the Trades' Hall, Glassford-street, Glasgow, for the purpose of taking steps for the formation of such an exchange in Glasgow. The chairman, Mr. A. Gray, after explaining the objects of the meeting, said they had the idea that things could be greatly improved in their city so far as the building trade was concerned by the formation of an exchange. No doubt every branch of the trade had their societies, but their idea was to combine them together for the benefit of each



## COMPETITIONS, CONTRACTS, AND PUBLIC APPOINTMENT.

## COMPETITIONS.

Nature of Work.	By whom Advertised.	Premises.	Designs to be delivered.
General Market, with Shops, Offices, &c.	London & Co. Bond.	177, 179, 181, 183, 185, 187, 189, 191, 193, 195, 197, 199, 201, 203, 205, 207, 209, 211, 213, 215, 217, 219, 221, 223, 225, 227, 229, 231, 233, 235, 237, 239, 241, 243, 245, 247, 249, 251, 253, 255, 257, 259, 261, 263, 265, 267, 269, 271, 273, 275, 277, 279, 281, 283, 285, 287, 289, 291, 293, 295, 297, 299, 301, 303, 305, 307, 309, 311, 313, 315, 317, 319, 321, 323, 325, 327, 329, 331, 333, 335, 337, 339, 341, 343, 345, 347, 349, 351, 353, 355, 357, 359, 361, 363, 365, 367, 369, 371, 373, 375, 377, 379, 381, 383, 385, 387, 389, 391, 393, 395, 397, 399, 401, 403, 405, 407, 409, 411, 413, 415, 417, 419, 421, 423, 425, 427, 429, 431, 433, 435, 437, 439, 441, 443, 445, 447, 449, 451, 453, 455, 457, 459, 461, 463, 465, 467, 469, 471, 473, 475, 477, 479, 481, 483, 485, 487, 489, 491, 493, 495, 497, 499, 501, 503, 505, 507, 509, 511, 513, 515, 517, 519, 521, 523, 525, 527, 529, 531, 533, 535, 537, 539, 541, 543, 545, 547, 549, 551, 553, 555, 557, 559, 561, 563, 565, 567, 569, 571, 573, 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LONDON.—For rebuilding the "Angel and Trumpet" public-house, High-street, Islington, Mr. Reid's Brewery Company, Limited.  
Courtney & Fairbairn .. £2,647 Patman & Fotheringham .. £2,471  
Creighton & Co. .... 2,647 Wells .. 2,455

LONDON.—For proposed alterations at Nos. 224, 226, and 228, Jid-street, St. Luke's, for Messrs. J. Allen, Lefevre & Co. Mr. L. Gordon Stanham, architect, 100, Queen Victoria-street, E.C. 4.  
Patman & Fotheringham .. £1,594 9 6  
Ingham .. £1,717 0 0 Richardson .. 1,433 0 0  
Gould & Brand .. 1,673 0 0 Thomas .. 1,437 14 0  
F. & H. F. Higgs .. 1,393 0 0 Jarvis & Sons .. 1,233 0 0  
Eydmann .. 1,395 0 0 London & Co. .... 1,159 0 0  
\* Accepted.

MALDON.—For rebuilding stables at the "Blue Boar," Maldon, for Mr. Chas. Armstrong, manager and receiver to the Colchester Brewing Company. Mr. J. W. Starr, architect, Cops Chambers, Colchester.  
A. Baxter .. £275 15 6 J. Corbett .. £295 0 0  
E. West .. 295 0 0 Jones Smith, Maldon .. 295 5 6  
\* Accepted.

MORECAMBE.—Accepted for the erection of business premises for Messrs. Kycroft & Firth, architects, Bank Buildings, Manchester-road, Bradford.  
Masters and Johnsons work—H. Binkley .. £1,159  
Plumbers' work—R. B. Abbott, Morecambe ..  
Plasterers' work—B. Sugden & Son, Bradford ..  
S. and J. work—Thos. Neale, Bradford ..  
Painters' work—John Fletcher, Bradford ..

NEWCASTLE.—For alterations to the "King's Head" Hotel, Seaward-road, for Messrs. J. and W. McDonald, Messrs. Marshall & Dick, architects, 4, Northumberland-street, Newcastle.  
Middletons Bros. .... 547 15 0  
Jas. Smart .. 610 0 0 William Hudson, .. 537 13 7  
Ed. Weatherill .. 524 15 0 Garsington ..  
Thos. Weatherill .. 525 5 0 \* Accepted.

OGMORE VALE.—For the proposed vicarage, Ogmor Vale.—  
D. Jenkins & Co. .... £1,520 J. Holmes .. £1,199  
E. C. Newby & Co. .... 1,400 Hatherly & Carr .. 1,187  
J. Haines & Son .. 1,294 W. Perkins .. 1,135  
D. C. Jones & Co. .... 1,159 F. Small, Barry (accepted) .. 1,135  
W. Bowers & Co. .... 1,159 P. Gaylard .. 1,159

PENTRE RHONDDA.—For the erection of library buildings, Ten Pentre. Mr. Jacob Rees, architect, Hulseide, Pentre Rhondda.  
J. and J. Rees .. £2,300 A. J. Richards, Pentre .. £2,300  
\* Accepted.

PETERBOROUGH.—For the erection of a dwelling house, New England, for Mr. Redhead. Mr. J. G. Stallebrass, architect, Peterborough.  
Rowe .. £1,100 18 9 Michin .. £1,038 0 0  
Gray .. 793 0 0 Sibley .. 250 0 0  
Bailey .. 284 0 0 Gutteridge (accepted) .. 350 0 0  
Bridgfoot .. 280 7 0

RYE.—For the erection of school buildings, &c., for the committee of the Congregational Church. Mr. T. Elworthy, architect, Rye.  
Francis & Patterson .. £660 G. Huggett .. £743  
Alfred Comport .. 783 A. E. Nunn .. 698  
Hy. Knook .. 750

SHEERNESS.—For the erection of house and shop, for Mr. Doughty. Mr. J. I. W. Pore, architect, Faversham.  
George Pavey .. £240 J. Osborne & Co. .... £470 0 0  
Walker .. 220 0 0 Leager, Sittingbourne .. 459 0 0  
G. Bowes .. 517 15 (accepted)

SHEERNESS.—For the erection of five houses, for Mr. Kite. Mr. W. Parrish, architect, Sheerness.  
Osborne & Co. .... £1,395 Reyle .. £1,215  
Brown .. 1,290 Pavey .. 1,214  
Leager .. 1,273 Bartard .. 1,060  
Hughes .. 1,245 \* Accepted.

SLITHWAITE.—For erecting board schools and master's house, Slithwaite, for the Slithwaite and Lingard's U. D. Board.  
\* Accepted.

For the erection of a dwelling house, for Mr. J. G. Stallebrass, architect, Peterborough.  
Rowe .. £1,100 18 9 Michin .. £1,038 0 0  
Gray .. 793 0 0 Sibley .. 250 0 0  
Bailey .. 284 0 0 Gutteridge (accepted) .. 350 0 0  
Bridgfoot .. 280 7 0

SOUTHAMPTON.—For alterations and additions to the "Pembroke" Hotel and the house adjoining in Penbrooke-square, and the general reparation of the same, for Messrs. Mew, Langton, & Co., Brewers, Newport, Isle of Wight. Mr. E. Cooper Poole, architect, 2, Portland-street, Southampton.  
Rice & Co. .... £295 G. Bagshaw & Son, .. £390  
H. Stevens & Co. .... 293 Southampton (accepted)

S. T. MARY CRAY.—Accepted for the erection of house .. £280 0 0  
Osborne & Co., Brighton

TUDMORDEN (Yorks).—For paving, &c., &c., Vernon and fifteen other streets, for the Local Board. Mr. H. Shaw, C.E., Surveyor, Town Hall, Todmorden. Quantities by Surveyor:—  
Benjamin Lamb .. £2,244 14 10 Wm. Chew (portion .. £1,600 10 8  
Thomas Gifford .. 2,215 9 0 of contract ..  
John McCabe & Co. 1,986 17 3 Thomas Horrocks .. 1,797 6 4  
Joe Johnson .. 1,935 6 11 Bunley ..  
\* Accepted.

WEDNESBURY.—For laying out a new street, Mesly Croft, for the Corporation. Mr. E. Martin Scott, Borough Surveyor, Town Hall, Wednesbury.—  
Curral, Lewis, & Martin .. £556 9 0 Jones & Fitzmaurice .. £470 0 0  
John Cashmore .. 450 0 0 Geo. Law, Kidder .. 427 3 8  
Jacob Biggs .. 450 0 0 M. H. Barnham .. 400 0 0  
John W. Peredy .. 455 18 6 H. Barnham .. 395 0 0  
Herbert Holloway .. 439 0 0

WHITCHURCH.—Accepted for the sewerage of Whitchurch, for the Cardiff Union Rural Sanitary Authority. Mr. William Fraser, Engineer of Works.  
Contract No. 1.  
J. J. Ince, Barry .. £681 9 0  
[Engineer's estimate, £749 9 6]  
Contract No. 2.  
Wood & Son, Cardiff .. £589 10 8  
[Engineer's estimate, £674 18 0]  
Contract No. 3.  
Frank Ashley, Cardiff .. £751 17 8  
[Engineer's estimate, £674 6 0]  
Contract No. 4.  
J. J. Ince, Barry .. £1,590 10 11  
[Engineer's estimate, £1,019 14 6]  
Contract No. 5.  
Mackay, Newport, Mon. .... £412 0 0  
[Engineer's estimate, £1,245 12 4]

WHITEHAVEN.—For the erection of a hospital for infectious diseases, for the Town and Harbour Trustees.  
S. McWhinney .. £4,376 2 9 Jonathan Young .. £3,044 10 0  
Wm. Bradley, .. £253 David Burns (painting .. 280 0 0  
Cumbria) .. 3,054 17 11 only) \* Accepted.

WIMBLEDON.—For No. 3 Contract, Wimbledon Park Estate, for the Wimbledon Park Land Company, Limited. Mr. William Hunt, architect and surveyor, 5, York-buildings, Adelphi.  
King .. £253 Nicholls (accepted) .. £555  
Mears .. 68

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# The Builder.

VOL. LXVI. No. 2667.

MARCH 27, 1894.

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## Boiler Explosions.



It is surprising how slow men are to apply the lessons which the experience of other men teaches them. Only when the experience becomes his own does the ordinary man begin to amend his ways. The truth of this is annually illustrated by the numerous boiler explosions which every keen frost brings in its train, with their harvest of damages to property, maiming, and death. Year after year the same object-lesson is taught throughout the length and breadth of the country—boilers burst because of frozen pipes. And yet, year after year, new boilers are fixed without the slightest attempt being made to lessen the risks to which every winter exposes them.

Mr. Lavington E. Fletcher, Chief Engineer of the Manchester Steam-Users' Association, has published a list of the "Kitchen and Circulating Boiler Explosions" which occurred during the sharp frost from Friday, January 5, to Tuesday, January 9, this year. For this period of five days no fewer than thirty-eight explosions are recorded, and it is more than probable that many others occurred which have escaped public notice. Of these thirty-eight explosions, twenty-three arose from ordinary kitchen circulating-boilers, and resulted in the death of ten persons and injury to twenty-nine others. The remaining fifteen cases were explosions of heating apparatus boilers in churches, chapels, schools, and other public buildings, and resulted in the death of two boys and injury to four men. All were due to the same cause—fires lit under the boilers when pipes were choked with ice; in other words, the circulation of water was stopped by ice, the boilers practically becoming sealed vessels, from which the gradually-accumulating steam-pressure could find no outlet save by bursting them. Steam is a good servant, but, like other servants, it must have certain liberties if peace is to be maintained.

One of the explosions included in Mr. Fletcher's list is the one which occurred at Adel Reformatory, near Leeds, on January 6

this year, and which has been made the subject of a recent investigation under the provisions of the Boiler Explosions Act, 1882. In this case the boiler was of the saddle type, made of wrought-iron plates welded together, and connected with two systems of flow and return pipes, which ran round the lecture-room in which the Sunday services were held. It appears that, on the morning of the explosion (a Saturday), two boys lit the fire as usual, and that in about three-quarters of an hour the boiler burst, dislodging the brickwork, killing one boy instantly, and scalding the other so terribly that he died the following day. It is the old story of frozen pipes. The circulation was stopped by ice, and, as there was no safety-valve, the pressure of steam gradually increased till at length it rent the iron with the sad results just recorded. A few shillings spent on a safety-valve would, in all probability, have prevented this and the dozen or more similar "accidents" which occurred on or about the same date, but many heating engineers are apparently too thoughtless to provide this necessary appliance.

The plumber who had fixed the boiler at Adel stated in evidence that he had fixed several similar boilers, all without safety-valves, but he acknowledged that a proper valve would have prevented the explosion. Other evidence was given apparently with the object of discrediting the use of safety-valves, but the Commissioners, in delivering judgment, attached little or no weight to these opinions; on the contrary, they declared their conviction that such explosions could be prevented by fitting a good safety-valve to each boiler, and maintaining it in a state of efficiency. They also recommended that provision should be made for emptying heating pipes when the apparatus is not in use. This provision can so easily be made in low-pressure hot-water systems, such as that at Adel, that it certainly ought not to be omitted. All that is required is the fitting of a draw-off tap to the boiler and a stop-tap on the feed-pipe. But the high-pressure system of heating does not lend itself to such an arrangement.

It may be interesting to turn for a moment to the recently-issued "Report on the Working of the Boiler Explosions Acts, 1882 and 1890." This belated report refers to the twelve months from July 1, 1892, to June 30, 1893, and records seventy-two

explosions, of which no fewer than twelve occurred in connexion with the heating apparatus of public buildings. The remaining explosions were of larger boilers used for developing steam formotive power in factories, ships, locomotives, &c., and do not fall within our province. Of the twelve explosions of heating-boilers ten\* were caused by the pipes or connexions being choked with ice, and all these ten occurred in the five days from December 26 to December 30, 1892; four of the boilers were saddle boilers, three tubular, one cast-iron vertical, one wrought-iron annular, and one is described merely as "wrought-iron." One boiler was "new" when it burst, while the age of the others varied from two to sixteen years. The two explosions not caused by frost were due (1) to "undue pressure, the overflow pipe being choked by sediment," and (2) to "undue pressure, the circulation of water having been stopped by air in the pipes;" the former of these is described as a "rectangular" boiler, and the latter as a "tubular" one. This brings the number of exploded tubular boilers to four—i.e., equal to the saddle boilers.

Fortunately, the death-roll from these "accidents" was small, only one person being killed; four only were injured. But this must not be taken as a full statement of the deaths and injuries caused by the explosion of boilers from frost in the year under consideration, for ordinary domestic boilers do not come under the Boiler Explosions Acts, and consequently statistics in regard to these are not given in the Report. The loss of life caused by the bursting of kitchen boilers is much greater than that caused by the bursting of heating boilers, and the provision of proper safety-valves is so much the more necessary. Unless persons responsible for the fitting of such boilers are more careful in the future to provide safety-valves than they have been in the past, it may be advisable to accept the suggestion of Mr. Howard Smith, one of the Commissioners in the Adel Reformatory Inquiry at Leeds, namely, that the provisions of the Boiler Explosions Acts should be extended so as to include the investigation of domestic boiler-explosions. Perhaps this would have the desired effect. Certainly the idea of imprison-

\* The report itself says "eleven," but in an appendix, containing a detailed list of the explosions, only *ten* are definitely stated to be due to frost.



ment for manslaughter would not be a pleasant one for architects and heating engineers to contemplate.

Another, and, probably, more useful method, however, of preventing explosions would be for corporations, local boards, and other authorities to include in their building regulations or by-laws a clause to the effect that a suitable safety-valve should be provided for every boiler, whether used for domestic purposes or for heating buildings. Certainly something ought to be done, and quickly, to prevent the deplorable loss of life which annually occurs from frozen pipes.

#### THE CHURCH OF ST. JOHN AT DAMASCUS.

By MR. W. R. LETHBRIDGE.

**T**HE drawing by Mr. Spiers of the interior of the mosque at Damascus, published in the *Builder* of February 17, is a most invaluable record of a building of great historical interest, which has now been terribly injured by fire.

The covered part of the mosque consisted of a central part, three bays long, running north and south, with a dome over the middle; and right and left three large parallel aisles, which opened away on each side, eleven bays long in both directions. Both of these great wings were roofed alike, with three equal spans resting on rows of marble columns, a large number of which had capitals that appear to be Early Byzantine.

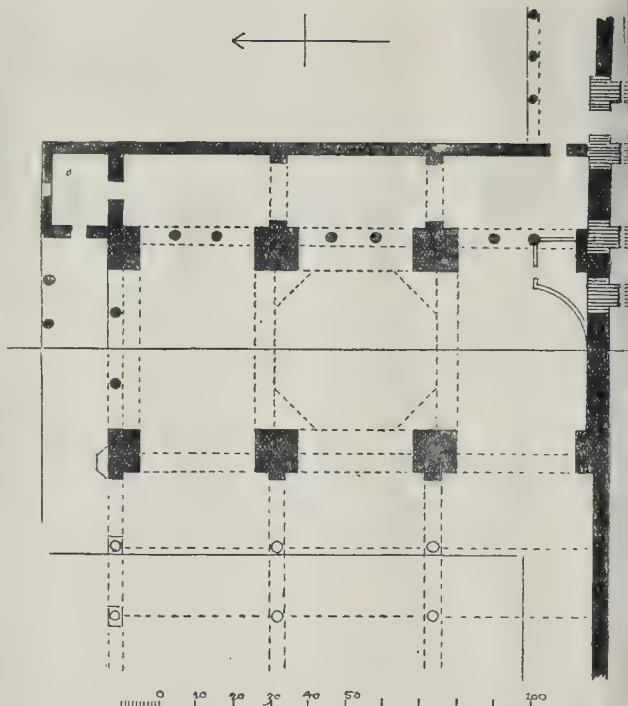
The centre and two wings cover a space about 450 ft. by 125 ft. Along the whole of the north side is a large open court, surrounded on three sides by an open arcade, which in part rests on marble columns with Byzantine capitals. The front of the covered part against the courtyard was an open arcade, with a row of arched openings above. This double tier of openings was exactly repeated in the two internal longitudinal arcades. The whole of this composite building has usually been spoken of as the Church of St. John, and it is even said that from the Conquest to the time of Walid, Christians and Muslims divided the building between them, the former retaining the western portion, and the latter taking the eastern. The central portion is always referred to as the transept. Mr. Spiers, whose knowledge of Byzantine art is probably unsurpassed, suggests that the western part was the original nave, and that the eastern wing was added by Walid.

I wish to offer an interpretation, and to clear the ground I would make these suggestions and remarks:—

1. Such great size (say 300 ft. by 125 ft.) is unknown in an early eastern church.
2. The span of the "transept" is wider by some 14 ft. than the central span of the "nave"; this also is unparalleled.
3. There are no women's galleries.
4. There is no precedent for three equal spans in a basilican nave, nor for upper ranges of openings.
5. A dome or lantern at end is most unusual, and probably unknown in eastern buildings of early date.
6. The transverse building is much the highest; it has continuous walls, with windows high up, which were partly blocked by the roofs of the east and west wings.
7. The end of the transverse building is evidently the main entrance out of the great court, and is opposite the fountain, as was usual in atrium courts.
8. The north side, for the whole length, opening with arcades to the court, is an impossible arrangement for a church.
9. The east and west wings being exactly alike, there is no reason for taking one as a portion of the old church and not the other. The whole forms a regular and perfect mosque.
10. If one wing only had belonged to the church, it would have been in a corner of the court.

The central "crossing," with the four great

piers and the niches at the angles, is engraved by Choisy in "l'Art de Bâtir," and a comparison of it with the church in Isauria, illustrated in the last supplement to the *Hellenic Journal*, will prove it to be of similar date—the reign of Arcadius. Here the crossing is greater transversely to the length of the church, and it is in the middle. Here also are similar niches across the angles above. The preparation for the dome of St. Sergius at Constantinople is but slightly developed from this, the niches being "slurred" into the domed surface. The Damascus dome itself above the cornice is, I suppose, Arab work. If the court, the entrance, and the "crossing" be original, this would



Plan and Section of Church of St. John at Damascus.

throw the axis of the church north and south. This direction is unusual, but by just adding enclosing aisle walls we obtain a very perfect early Byzantine church of large dimensions, and it at once appears how easily the builders (if my supposition is correct) taking down the aisles, made their wing three spans open out from the lateral

of the church. In Fig. 1 the bottom part shows the present arrangement with two of the eleven bays developed from this, the niches being "slurred" into the domed surface. The suggested original state.

Fig. 2 is a section from north to south through the centre, in which the left-hand shows the present state, with the lines of

of the extensions blocking up the windows dotted. The right side shows how women's galleries may have been obtained, and the whole has a remarkable resemblance to St. Irene. My sketches are compiled from M. Choisy's plate, Mr. Spiers's sketch, the published plan, and several photographs.

It is known that the present mosque stands within the temenos of a late Syrian temple of the style of Baalbek and Palmyra. At Palmyra there is a similar great colonnaded court within which the temple stood, with its axis north and south. The temple of Baalamin, also near Damascus, is entirely similar in respect to its enclosure and direction.

Now, at Damascus, the south wall of the church coincides with an ancient wall, and a fine ancient triple gateway occurs where shown on our plan. I suppose that the church was backed against the old boundary in a large court which was formed about it—east, north, and west. The situation on an old site, and partly on old walls, may have furnished the reason for its pointing south. This direction, however, is not without parallel.

De Vogüé gives an engraving of an important fourth-fifth century church at Quennauat, in Syria, which has its atrium to the north and its sanctuary exactly south. Other examples might be given; all the early Jewish synagogues in Syria lie on a meridian.

The square end is, again, not without precedent; the early Syrian church at Behio, ("La Syrie Centrale"), is square-ended, and there seems to have been an actual pre-judice in this region for making the sanctuary end square on the outside, only forming the apse within; and this may, of course, have been easily accomplished for the ground story at Damascus, as suggested on the plan.

#### NOTES.

**T**HE London and India Dock Company have been making, during the past year, very great improvements at the Blackwall end of their West India Docks. The old entrance, which was only 45 ft. wide, has been entirely reconstructed, and its width increased to 60 ft. The locks leading to the import and export docks have also been rebuilt, and increased in width to 60 ft. The work is being carried out under the direction of Mr. H. F. Donaldson, the engineer to the dock company, by Messrs. Lucas & Aird, and is now well advanced, the rebuilding of the import lock being completed. The swing-bridges over these inner locks, which carry the railway traffic between the Millwall Junction and South Greenwich stations, have been lengthened to suit these alterations. This work has been done by Messrs. Sir William Arrol & Co., who adopted an ingenious method of accomplishing a somewhat difficult undertaking. As the railway traffic over these bridges could not be interfered with, the structures were temporarily supported on timber trestles resting upon the bottom of the lock. The lattice webs of the main girders were then entirely removed, and the top booms raised such a distance that the stress due to the additional length that had to be added to the end of the bridges, remained the same as formerly. By this means the booms of the girders required no alteration, and only new webs were necessary, in addition to the portion required to lengthen the bridges.

**W**E regret to notice that the Corporation of Sheffield have received (and apparently mean to act on) a recommendation of a special committee appointed to consider the subject, to the effect that the City Surveyor, if his office and staff are re-organised, will be able efficiently to carry out any architectural work required by the Corporation. The effect of this will be that architectural work done for the Corporation will be reduced to the level of official archi-

ture, and we all know what that generally means. The Sheffield Society of Architects and Surveyors addressed a protest to the Corporation against this intention, on the ground that the City Surveyor had work enough to occupy him in the ordinary exercise of his proper functions, that architectural designs made by assistants in his office were not likely to be of the highest order, and that the design and erection of public buildings furnish some of the best opportunities which architects seek for the legitimate display of their abilities, of which they would be deprived under the proposed new departure. This latter is in itself a perfectly legitimate reason for the architects to urge, however little weight it may have with the City Council. Sheffield contains some very able architects, who have far more than a local reputation, and it is paying them a very poor compliment to propose to dispense with their services for the future. But it is an even more important consideration that the architectural character of new buildings in the city must inevitably suffer by their design being relegated to an official department. It always has been so and always must be so. The persons who are suited to and will put themselves into official harness are scarcely ever the class of persons who will impart artistic feeling and effect into works of architecture. Recent criticism in America has attributed the poor and uninteresting character of public buildings in the United States mainly to the fact that the system of designing such buildings in the municipal offices has been paramount, and there is a strong and growing public feeling against it. In our own country the poor, tame, and uninteresting buildings which have been erected for the Post-office department in various towns in England, from designs prepared in the Office of Works, are so many witnesses of the fatal effect of officialism in connexion with architecture. If the Sheffield Corporation carry out their intention, they will be doing more than casting a slight on their leading architects; they will be taking the worst step for the architectural adornment of their own city. Perhaps the latter consideration may move them, if the former does not.

**D**R. PAUL KRETSCHMER has done good service to archaeology by the publication of his book on the inscriptions of Greek vases, just issued. In his preface he draws attention to the fact that we have in the material so collected a new source for the knowledge of the popular as opposed to the literary speech of Greece. Many forms that have been supposed to be mere cases of mis-spelling are, in reality, instances of popular speech actually current at the time. The writer deals with the inscriptions from the point of view of linguistic form, not subject-matter, hence detailed criticism would have been out of place, but the book is one that no student of vase-paintings can afford to neglect, because necessarily the question of dialect throws light on that of *provenance*. To take an example, the interesting Euphorbos plate in the British Museum, as it was found at Cameiros, has been usually classed as Rhodian, but a comparison of its inscriptions with those undoubtedly known as Rhodian, show that, according to Dr. Kretschmer, the plate was imported from Argos.

**W**E hear that no less than seventy-six designs, sixteen of which are from England, have been sent in for the competition for two new bridges across the Danube at Budapest. The jury appointed by the Hungarian Minister for Commerce met, under his presidency, for the first time on the 18th ult., when a sub-committee, composed exclusively of members of the architectural and engineering professions and artists, was appointed to conduct the preliminary examination of the designs. At the invitation of the Minister of Com-

merce to the respective Governments representatives from Vienna, Paris, Berlin, and London have joined the committee. The result of the adjudication is not expected for several months.

**T**HE Hygienic Congress to be held at Budapest in the autumn seems to be succeeding in its preliminary arrangements to an extent which may be called almost alarming, since we are informed that there are 362 Hygienists and 78 Demographers already entered on the lists, who will read 440 papers. By what division of labour these are to be got through in eight days it is not easy to imagine. The number of the sections has been increased by one, the "Samaritan Congress" having consented to amalgamate with the general Congress, but we presume this institution will bring forward its own papers as an addition to the 440. It is announced also that the medical officers of the German railways, and the cremation societies, will also hold their meetings at Budapest in connexion with the general Congress. But who is sufficient for these things?

**T**HE reception given by Mr. and Mrs. Edric Bayley and the members of the Governing Body of the Borough Polytechnic Institute on Thursday evening, March 8, gave an excellent opportunity to a number of visitors of carefully examining the working of a Polytechnic Institute. Much has been written about the starting of Polytechnics, the provisions of the necessary buildings, and the collection of funds, but owing to the organisation being a novel development the actual working of the schemes is not quite so familiar. It is within recollection that this Institute acquired the buildings of the Pastor's College at 103, Borough-road, and under Mr. Rowland Plumble sundry alterations were made and extensive workshops added. The reception gave an opportunity of examining the new workshops and seeing the educational and social departments in the ordinary course of work. The workshops have been added at the back on the ground floor, and are mostly top lighted, and comprise bookbinders', mechanics', bricklayers', metalplate, engineers', carpenters', pattern-makers', and plumbers' workshops, and a smithy, the necessary power for the engineers' workshop being supplied by gas-engines. The rest of the building is devoted to lending library and reading-room, billiard-room, gymnasium, and offices. On the upper floors are concert-rooms, engineering and building construction studios, photographic studios, modelling rooms, and chemical laboratories. The Institute is available for men and women under certain restrictions, and the numbers attending, with more or less regularity, are little short of 2,000. The objects of the scheme appears on the first page of the second annual report which is before us, and are declared to be "the promotion of the industrial skill, general knowledge, health, and well-being of young men and women belonging to the poorer classes. This has been done by the organisation of educational classes, designed to reach young men and women in every branch of business or trade, free lectures and entertainments, clubs and societies—social and athletic, provision of reading-room and library, and a variety of social agencies." The fees, which are extremely low, and range from 1s. per quarter to 17. per annum, are quite inadequate to meet the outgoings, but grants are to be obtained from the County Council, and the receipts for the year 1893 show that considerable additions to the Institute's income were derived from the central governing body of the City of London Parochial Charities, from Herold's Foundation, and from the Central Governing Body. An interesting analysis appears in the report of the trades followed by the men and women members, and amongst the men



the highest number of 505 appears under the heading of clerks, followed by 95 composers, 86 engineers, 79 warehousemen, and 69 shopmen. These are only a few in a long list of 100 scheduled occupations. Amongst the women, the highest number of 271 appears under the heading miscellaneous, followed by 77 dressmakers, 67 clerks, 42 machinists, and 39 shopwomen, in a list of 77 scheduled occupations. From what we have seen and from a careful perusal of the last report, there seems little doubt that this and kindred Polytechnics are on the threshold of a great educational and social development which cannot fail to have an entirely beneficial influence upon the members who are disposed to avail themselves of its privileges, and in this work we wish the governors ample funds and the success which, with wise management, is sure to follow.

A NUMBER of architects and representatives of the Press assembled at the works of the Marble (Moreau-Rae) Syndicate, Limited, in Chelsea, on Wednesday last (14th inst.), to witness the methods adopted by that firm in producing marble from earthy limestone. The invention, we are informed, is of French origin, and has only recently been introduced into this country. The majority of inventions which profess to harden stone artificially, or to produce marble from the softer kinds of stones, merely succeed in putting a hard surface on the material, which is then capable of being enamelled, or otherwise coloured. Thus the bulk of the stone remains as before, except that it has a harder surface. The result is that moisture is liable to collect behind the skin, and the face flakes off. The effect produced by the Moreau-Rae process, however, is entirely different; so far as our limited observations permit us to judge, the stone operated upon is hardened throughout, so that not only is its surface capable of being polished, but the block being cut through in any desired direction the cut surfaces may also be polished. The process may be briefly described as follows. A slab or block of chalk, Bath or Portland stone—in fact any absorbent stone containing a large percentage of either the carbonates of lime or magnesia, or both—is suitable for the purpose. A tank of water is prepared, and varnish, coloured with some pigment, is dropped on to the water and spreads unevenly over its surface. The skin of varnish is broken up through the medium of some fluid which may be applied by a brush-sprinkler, or otherwise, the varnish at the same time forming in patches and streaks. A face of the stone to be operated upon is now dipped into the water, when the streaks and patches of varnish adhere to it; the material is afterwards dried. Subsequently, it is immersed for a few minutes in tanks containing sulphate of iron, copper, zinc, &c., according to the tints required. The sulphates will not penetrate, or only slightly, those portions of the stone covered with the varnish, and thus a pattern is produced; which, however, is not apparent until the material is immersed for about half-an-hour in water having a temperature of approximately 120 deg. Fahr., which assists in the alteration of the sulphates into carbonates. Up to this point the only thing accomplished is the staining of the stone throughout. It is then subjected to the hardening process, which indurates not only the surface, but the interior of the stone. To all intents and purposes a block of marble has been produced which may be polished in the usual way. So far as colour is concerned, any tint or combination of tints can be produced; but the colouring is not so intense in the interior of a block as at and near the surface. Judging from samples exhibited, it would appear also that the tints have a tendency, inside the stone, to run in zones parallel with the surfaces exposed to the sulphate solutions; and there are some other points that seem to admit of improve-

ment. The change the stone undergoes is mainly a chemical one; whether its structure is in any way modified is a matter upon which we cannot venture an opinion without a more detailed examination. It is certain, however, that it gains considerably in weight proportionately to its degree of porosity. On the whole, this is the most successful attempt we have hitherto seen of producing marble artificially. The practical application of the invention lies in the circumstance that limestones may be carved and moulded when soft, and then "made into marble," whereby a considerable saving in expense is effected over the difference of carving in real marble—that is to say, for those who think that such jugglery with material is any addition to architecture. We are certainly not among them.

THE fourth of the course of lectures on matters connected with building, which the Carpenters' Company have arranged for, took place at Carpenters' Hall, London-wall, on Wednesday, when Professor Banister Fletcher lectured on "Englishmen's Home." The lecture was an attempt to describe the Englishman's home from the time of William the Conqueror to Victoria, from the Anglo-Saxon hall to the modern mansion; and since the lecturer had little more than an hour in which to deal with a subject which would require many hours to adequately discuss, his remarks consisted practically of a synopsis of the subject. He was able to do little more than enumerate some of the many charming castles and manor houses of the eleventh and succeeding centuries, but his audience must have been grateful to him for showing a fine collection of lantern slides and photographs, which, had the lecturer been less ambitious in the treatment of his subject, and thereby left more time for their inspection, would not have been so hurriedly shown.

THE accident at the Charterhouse School at Godalming, from the sudden giving way of a temporary platform, 14 ft. high, with five-hundred boys on it, is one about which we ought to have further information. Five boys, it appears, have sustained severe injuries; and it is only by good luck that the results were not a good deal more serious. Who was responsible for the construction of the platform and for assuring the head master that the structure would bear twice the weight it was required to bear? and is not such an erection within the power of inspection of any official surveyor in the district? The public, as well as the parents of the injured boys, will certainly require to be satisfied on these points.

TWO interesting properties in Surrey will shortly be offered for sale—viz., Imber Court, near Thames Ditton, with grounds of about 70 acres, watered by the Mole, and with a house attributed to Inigo Jones. The manor of Imber, or Imworth, passed from the Brasse family to their heir-general, Thomas, Duke of Norfolk, and then, having been annexed by Henry VIII. to his chase, Hampton Court Chase, was restored on a petition addressed to the Protector Somerset. In 1630 it belonged to Dudley Carleton, Viscount Dorchester, whom his nephew, Sir Dudley, succeeded there; in 1720 to Henry Bridges, who settled it upon his niece on her marriage with Arthur, afterwards Speaker, Onslow, and there the Onslows lived for some while. Sir Francis Burdett also resided at Imber Court. Two wings were added about one hundred years ago to the house, which was built of brick and succed over. The other property is that of the manor-house, Upper Tooting, which in name, at least, carries us back to the Conqueror's time, when Haimo (de Gravenell) the sheriff,

held Tooting of the Abbot of Chertsey. In the reign of Henry II. a de Gravenell bestowed the manor-tithes and the church advowson upon St. Mary Overeye's, Southwark. The manor has had many famous owners, including the Dymock, Maynard, and Whichcote families. Sir Henry Maynard, whom Queen Elizabeth honoured with a visit at Tooting, was Lord Burghley's secretary. In 1717 Alderman James Batemans bought the manor, and in the next year was buried with much pomp in the old church. In 1767 it was bought for 25,000*l.* by Morgan Rice, a distiller, who built Hill House, near the church. The church was rebuilt in 1833, and enlarged after the designs of Mr. St Aubyn, in 1873-5.

THE exhibition of the Society of Painters in Watercolours at the Watercolour Society's room is, as usual, a very interesting one, though one or two of the best etchers of the day are not quite as well represented as there have been on previous occasions. Still there is a great deal to look at, both within and without the true scope of etching. This as we have before urged, consists really in the free indication of effects of composition and of light and shadow contrast, not in high finish, in which this freedom of line is lost, and the work becomes only an engraving done by a different process; it may be very admirable in its effect, but it loses the character belonging specially to etching. A comparison of two subjects from "Sandwich," nearly from the same point of view, will illustrate this; No. 14, by Mr. Percy Thomas and No. 63, by Mr. H. R. Robertson. Both are good, but the former is an etching, the latter is an engraving. Compare again Mr. Gascoyne's two fine sketches, "Showery Weather" and "Wind, Weather" (21 and 52), with Mr. Dalgleish's "The Coming Storm" (139). In the former the mass and movement of the clouds is just indicated broadly; in the latter the effect has been spoiled by the attempt to shade up the clouds into a realistic effect, which the method of etching is not fitted to accomplish. Mr. Massey's broad sketches (152, 155, 161, 162) may similarly be compared with Mr. Murray's neat vignettes near them (were they hung in juxtaposition on purpose to point the moral?); the latter are prettier, the former have more life. M. Legros's remarkable collection at the top of the room contains things, it is true, which are rather ostentatiously rough in workmanship, but some of these are very fine in suggestion, especially the landscape effects; "Lisière de Forêt" and "Paysage au Bateau" (102, 103) for instance. There is an impressive and gloomy poetry in the two subjects entitled "Triomphe de la Mort" (89, 90). Mr. Hall manages to preserve a great deal of the special character of etching in his large and highly-worked plates "Amiens Cathedral" (37), "San Juan de los Reyes" (41); the latter, though smaller and less remarkable at first sight, is the finer work of the two. Mr. Short has some excellent small etchings, but hardly equal to what he has done. Mr. Herbert Marshall contributes some etching of London. Among other works may be mentioned those of Mr. P. Robertson; Mr. Alfred East, especially an admirable study of rainy effect in "The Last at the Fair" (114); Mr. Slocombe; Mr. R. Goff; and the admirable and inimitable dry-point studies of M. Helleu. Mezzotints, like those by Mr. Knight, excellent in their way, should be noted in the catalogue as "mezzotint;" the public are ignorant enough as to what etching really means, without being misled by the catalogue. Mr. Strang's contribution seem to show less of genius and more ugliness and eccentricity than before, and his way of executing half-length portraits by working up the face only and leaving the coat, &c., nearly untouched, gives his subjects the appearance of being "persons of colour," as negroes call themselves in the States.



THE Exhibition of the Institute of Painters in Watercolours contains a few very interesting works amid a great deal that is of little interest. The President's portrait work, "Katherine" (265), is a very interesting woman clad in dress which makes a fine harmony of colour. Among her figure pictures may be mentioned "Claret and Small Beer" (345), by Mr. F. Add, one of the best in the room in the way of drawing and character; "The Ball at Dr. Timber's Establishment" (420), by Mr. R. Steer; "A Lesson in Geography," by Mr. Townley Green (346); the shadows on a man's face are surely too red; "An old-fashioned Christmas Dinner" (377) by Mr. C. Green, clever in character but dreadfully hard in execution. "The Guerdon of Mally" (16), by Mr. Bundy, is much too good drawing and character for the loud colour and the lack of interest in the incident. "Autumn, a Caprice," by Mr. Fowler (212), is a fine piece of vague colour. Among landscapes and architectural works there are a few fine things: "A Breezy Moorland" (14) by Mr. R. B. Nisbet; "Cornfield, East Hilling" (155), by Mr. Wimperis, and one of the best of his works we have ever seen; "Steaming into Lincoln" (217), by Mr. Atman; "The Rising Moon" (262), by Mr. Aumonier; "Corrie" (272), a little masterpiece by Mr. E. J. Gregory; "King's College Chapel and Entrance" (321), by Mr. Millyo; "The Milk" (381), a little coast scene full of air, by Mr. J. White; "Nine-mown Down, Dorset" (395), by Mr. H. G. Lane; and "Early Autumn on the River" (657), by Mr. Nisbet. "Waiting for the Coach" (661) is a good study of figures and interior by Mr. E. C. Clifford. Mr. Harry Hine's large view of York Minster from the south-west (612) is too much like an old style of cathedral views, with a false colour on the building and a studied look of rapidisation in the surroundings which does not in fact exist.

## ROYAL INSTITUTE OF BRITISH ARCHITECTS:

### LONDON STREETS AND BUILDINGS BILL.

A SPECIAL general meeting of this Institute was held on Monday when, on the motion of the President, Mr. J. Macvicar Anderson, it was decided to present the Royal Gold Medal for the year to Sir Frederic Leighton, Bart. The tenth general meeting was next held, when the following gentlemen were elected:—As Fellows, Messrs. John Perrins Osborne, Thomas Battersbury, Albert Talbot Brown, David Jenkins. As Associates:—Messrs. Charles Kempson, Leicester; Harry Barnes, Sunderland; John Ernest Mowlem, Loughborough; Henry Dearden, Batley; Edward Boxer, Finsbury-park, N.; Ernest Robert Brown, 76, Mount-street, W.; William Henry Sheppard, Penrally; Arthur William Sheppard, Architect's Office, School Board for London; Harold Clapham Lander, 6, John-street, Bedford-square, W.C.; David Forbes Smith, Salisbury; William Tillott Barlow, 23, Finsbury-circus, C.; Francis Peter Halsall, Southampton; George Ernest Nield, Monument Station-buildings, King William-street, E.C.; John Robert Earnshaw, Manchester; Franklin Kaye Kendall, 1, The Paragon, Blackheath, S.E.; Roger Francis Bacon, Reading; Harry Evans, 9, Moorgate-street, E.C.; John Edmund Little, Bolton; Arthur James Forge, Woodford, Essex; Frank Lishman, 51, Randolph-road, Clapham-common, S.W.; Arthur Hill Morgan, c/o T. M. Lockwood, Foregate-street, Chester; Douglas George Alder (Tasmania), 11, Spring-gardens, S.W.; John Lloyd Houston, 13, Furnival's Inn, E.C.; George Harry Mael Trew, Woking; John Humphreys Jones, B.A. Lond., 9, Moorgate-street, E.C.; John Newnham, 61, Palace gardens-terrace, Kensington, W.; William John Childs (New Zealand), 7, Cedars-villas, Putney ridge-road, S.W.; Alfred Kirk Brown, c/o Messrs. Smith & Brodick, Cogan-chambers; and Preston, Hull.

A discussion on the London Streets and Buildings Bill, promoted, as a private Bill, by the London County Council, and entitled "A Bill to consolidate and amend the enactments relating to Streets and Buildings in London," the suggested short title of which is "The London

Building Act, 1894," was then opened by Mr. Arthur Cates, Past Vice-President, who read a short paper. He said that in considering the Bill great difficulty arose from the fact that this Bill "For the Consolidation and Amendment of the Enactments relating to Streets and Buildings in London" did not contain the slightest indication as to what was consolidation, what was amendment, and what was new. A draft Bill should have been circulated with references and explanations, and the new parts printed in different type from the old. In regard to Part I., on the Formation and Widening of Streets, although this part was to a considerable extent only a paraphrased re-enactment of existing laws, there were proposed extensions of the law which would give rise to some opposition from those who appreciated the possible effect which might result from its provisions.

The general powers sought in this part apparently affected not only new streets but the widening of old ones, and in this latter respect especially demanded the most careful scrutiny.

Clause 7, by which the Council might require a greater width of street than 40 ft., was especially important as directly applying to not only new but to old streets, so that if it should be desired to widen an old street to 40 ft., the Council might insist on its being made wider up to 60 ft. Some modification of this clause might be found possible, which might in some degree remove the objections as regards old streets, by providing for payment for the injury done by the exercise of the powers given by the clause.

Clause 9, which regulates the position of new buildings with reference to streets, was, as it stood, objectionable, and should be amended and then limited to new streets. The expression "new building" occurred in this clause for the first time, and on referring to Clause 185, sub-Clause 18, eleven distinct definitions were found to be there given of these words.

He would say a word in favour of Clause 14, which in new streets enabled the Council to require as a condition of consent that beyond the full width of the roadway a space not exceeding 5 ft. should be left between the footway and the external wall of the houses; with some little amendment, that would be an admirable provision.

In Part II., dealing with lines of building frontage, Clause 15 was understood to be only a re-enactment of section 75 of the Metropolis Management Amendment Act 1862. But in 1890 the London Council were not sure as to their powers under this section, and in their General Powers Bill endeavoured to obtain direct power over corner sites: happily, the petition of the Institute, and its subsequent action before the Select Committee of the House of Lords on the Bill, were on this point effective, and the Act of 1890 contained in Section 33 limitations which confined these powers to new sites. This Act of 1890 was to be repealed, and the law would stand simply as set out in Clause 15, with the result that, if a building projecting at a corner beyond the line of buildings in the street was pulled down, the superintending architect might be called upon to define the general line of buildings in both streets, with the result that the corner building site might be cut down to a mere strip or vanish altogether under the operation of this clause. It was, therefore, imperative that some saving amendment should be made.

The novel and restrictive conditions in Part IV. in regard to open spaces about buildings and the height of buildings, had evidently been framed with great care and pains—with the desire to apply to the whole of London, old and new, present and future, legislative control which should in the end make it what in the eyes of the framers would be a model of sanitary perfection. But it proposed an ideal condition of things; and when brought to the test of actual application, the restrictions were found to be so oppressive and destructive that they could not receive any support from those who could appreciate the far-reaching and crippling effect which they would have on vast interests of occupation and business in other districts than the slums they were intended primarily to benefit. The provisions for compelling setting back in narrow streets could not have been seriously considered; they would be oppressive and obstructive in practice. The limit by Clause 36 of the height of buildings to 75 ft., except with the consent of the Council, was not unreasonable; but if the other provisions of this part became law the restrictions contemplated would render the cases in which the limit could be taken advantage of few indeed, since most new buildings would of necessity be kept down to the modest maximum of 40 ft. or even less. The two stories in the roof permitted

by Clause 36 should, as also the whole roof, be required to be of fire-resisting construction.

In Part V., dealing with construction of buildings, the clauses from 39 to 68 were occupied with details and regulations affecting the construction of buildings, which in many particulars required technical amendment.

The introduction of scantlings for joists, in Clause 43, was undesirable; the whole should be eliminated, and if any minimum was to be fixed it should be done by-law, and even then spans of 18 ft. and 20 ft. for single floors should not be recognised.

As regarded the construction of roofs (Clause 48), where there were any stories in the roof the floor of which should exceed 60 ft. above the street level, such roofs and stories should be of fire-resisting construction. There was not any provision for a continuous backbone to a party wall, or which would affect the common practice of so arranging flues in party walls that what professed to be a two-brick wall, 18 in. thick, was really a hollow wall of two outer faces, each 4½ in. thick.

The requirement under Clause 55 that "every habitable room shall be at least 8 ft. 6 in. in height" was excessive.

In Part VII., dealing with rights of building and adjoining owners, Clauses 72 to 86 were intended to embody the law affecting party walls, with certain modifications and amendments, all of which were not improvements. The chief points for consideration were:—The giving (under Clause 72, Sub-clause 6, p. 41) a right to the building owner to place on the ground of an adjoining owner the projecting footings and concrete or other solid substructure of his external wall, making compensation for any damage occasioned thereby. It would seem that the interests of the adjoining owner to be compensated should be represented by some word or words of wider significance than "damage." Clause 75 shortened the statutory period of notice from three months to two, a change the desirability of which was doubtful. In Sub-clause 2 of the same clause, obligation on the building owner to shore up the adjoining ground or building should be distinctly stated. The change made by Sub-clause (8) in the manner of settling differences appeared objectionable. The present system of three surveyors had worked admirably for nearly forty years. Clause 78, which provided for underpinning by a building-owner of an adjoining owner's foundations when they were within 10 ft. of the new building was new, and desirable. In regard to By-laws (Part XIII.) the powers given were very wide, and should be carefully guarded. The provisions for making By-laws known, and for appeal against them when desired, were very imperfect and unsatisfactory.

The existing legislation was the result of much discussion, and was nearly satisfactory; it was expressed in the Metropolis Management and Building Acts Amendment Act, 1878 (41 & 42 Vict. cap. 32), sec. 16.

There was one thing wanting in this legislation—the publication of the confirmed by-laws in the public press so that they might become known to all men—and it would have been reasonable to suppose that an Amending Bill would have made good this defect, and provided for full publicity being given to the by-laws by which the great interests of the Metropolis of the Empire are to be governed; but every safeguard of publicity had been carefully expunged; and the publication of regulations which might intimately affect the interests of the inhabitants of this city, was to be effected by the hanging up of a printed copy in the principal office of the Council; and the London Council was to be placed practically in the position of absolute power to make pretty well what by-laws it might like, and leave those subject to them to find out, as best they might, what they were.

In regard to legal proceedings (Part XIV.), Clause 150, relating to the Tribunal of Appeal, could not be passed without notice. The number of members proposed—five—was too great; with five members, of whom three would form a quorum, there might not be that continuity of view which a smaller number would insure, and the expense of the remuneration of the members would be greatly increased.

In regard to Part XV. (miscellaneous) he need only invite particular attention to Clause 185, "definitions," which required careful study and investigation.

On (14), p. 94, "base," he thought it almost certain that the words "or girder or bressummer" would be added, thus making the base of the wall on a bressummer the top of the bressummer, which, with the addition of "to include bressummers," in Art. 1 of the First Schedule,



p. 101, and the application of "base" as defined by Art. 6 of the First Schedule, p. 102, defining the manner of measuring the height of a wall, would remove the great difficulties which existed at present in dealing with the front and back walls of business premises. There were various other definitions which might be amended, and in some cases those set out in the Draft Bill prepared by the Institute were preferable. All required careful consideration before they could be admitted to be correct.

It was hardly possible that even at an adjourned discussion the opinion of any large number of members qualified to express them could be obtained; he would, therefore, suggest that it would be a great assistance to the Practice Standing Committee if members would send to the Secretary of the Institute any suggestions and criticisms they may desire to offer on foolscap written on one side only; and he was sure the Chairman of the Building Act Committee of the London Council, who was so anxiously desirous that the Bill should be made as perfect as possible in all technical detail, would be happy to receive suggestions at any time.

At the conclusion of Mr. Cates's remarks, The President said they were favoured with the presence that evening of Dr. Longstaff, the Chairman of the Committee of the London County Council charged with this Bill. It would be only courteous to afford him an early opportunity for any observations he might have to make.

Dr. Longstaff thanked the meeting for giving him an opportunity of speaking at an early period, and considered that it might to some extent facilitate the discussion which was to follow. Mr. Cates had been in a position of peculiar difficulty in reading his paper, and they had found themselves in a similar position in the conference which had taken place. Mr. Cates had stated to him that anything which he might say would not be binding on the Council of the Institute, and he (the speaker) had similarly remarked that anything which he might say would not be binding on the London County Council. Therefore, they had been in a hypothetical state for some time, and it would be noticed that a good deal of the paper had been written in the form of very polite hypothesis. He was happy to be able to say, however, that a good many of these hypotheses had now become substantial facts, and that the ground had been a good deal cleared. With very few exceptions, if they omitted for the moment Part 1 and Part 4, he thought he might say that the County Council had accepted all the amendments suggested by Mr. Cates. There might be one or two small points, but very nearly all of the suggestions had been accepted. When it came, however, to the question of sanitary principles, he was afraid that the agreement was not yet so cordial as they might wish, but he thought he might say that the Committee in charge of the Bill, when they debated *in camera*, on the departure of Mr. Cates and his colleagues, agreed to accept such modifications of Part 1 of the Bill as they thought would satisfy the Institute. With regard to Part 4 of the Bill—the most difficult of all—he was not in a position to speak definitely, because, during the course of the Conference, methods of approaching the matter were sketched out, and these suggestions had to be considered very carefully by the committee. The committee had given certain instructions to the draftsman, and until they saw the result of these in print, and deliberated upon them once more, he was not able to say how far they would meet the wishes of the Institute. He might say this, however, that he believed it would materially modify the drastic and bald expressions found in the Bill before. In regard to one thing that Mr. Cates had said, he would like to add a few words in justification of the County Council. Mr. Cates had spoken with some severity as to the form in which the Bill had appeared, and as to its imperfections. That was due to many causes, but the prime cause was the modern ideal of doing everything by committee. He could not possibly conceive any worse instrument to be devised for drawing up an Act of Parliament than a committee. To begin with, the committee was not always there, and when it was there it was not always the same committee. Then a committee had the habit of losing its patience, not to say its temper; again it was not always consistent. These were difficulties inherent in all committees with which he had had to do, and they had been numerous. With a committee which had to meet once a week to discharge an agenda paper consisting on an average of eighty-five to ninety-five items, and had to get through legislative work, the difficulties were not diminished. The

Building Act Committee had been now, for close upon five years, grappling with the subject, in all the odds and ends of time it could squeeze in, and the immense difficulties they had to contend with constituted one of the causes of the imperfections of the Bill. Another cause was this—when they had made up their minds, the matter had to be placed in the hands of the Parliamentary draftsman. Now, the Parliamentary draftsman had his own ideas, and not only that, but being neither a builder, architect, nor surveyor, he did not understand three-fourths of the technicalities of the Bill. He, therefore, introduced terms which, from his point of view, were all right, but the result was not always what might be anticipated. Then, again, their draftsman was extremely busy, and the Committee had little time to lose in bringing in this Bill, for next year there would be a re-election of the Council and another breach of continuity. Another difficulty connected with the matter would, he believed, be appreciated. They desired to consolidate, and it was only a question of how much they could consolidate. They had to draw the line at the sanitary laws, and it was found when they consolidated those provisions, and especially those relating to the streets, they had various Acts running over many years, and they had been drafted by various draftsmen. The phraseology of the different Acts was inconsistent, and, when they came to attempt consolidation, it was found that a great deal of re-writing was required. When that was done, there were all sorts of consequential inconsistencies, so that a great many of the provisions were now in a much simpler form of words, and altogether in a much more symmetrical form than had before been attained. He did not think that Mr. Cates was quite fair to them in regard to the by-laws. They had no intention of asking for power to do anything they liked, and he differed from Mr. Cates on the peculiar virtue of publishing the by-laws in the papers. Nobody would ever look for them in those periodicals, while the publications of the London County Council could be always obtained very near to Spring Gardens. Then Mr. Cates did not think that they went nearly far enough, but that they should appeal to owners to set apart a certain portion of their estates for open spaces. He was very glad to find that, in this matter, Mr. Cates was even more progressive than the County Council, and if he could get a clause which should compel every owner who built in the suburbs to devote a certain amount of ground to open spaces, he, the speaker, would not say nay. The great point on which there was a difference of opinion in this Bill was how far they were to be influenced, in the broad sense of the term, by sanitary considerations. The Bill pointed out, in the first place, how important the question was, and, in the next place, the particular things considered essential to health. If that was so, how were they to be obtained with the least interference with the rights of individuals? Although he attached very great importance to this clause of the Bill, he felt sure that the result of the conferences they had had would be eminently practical. He thought that the gentlemen representing this Institute and the Surveyors Institution, having shown that there were cases in which the principles laid down were not applicable, this would help them, because it would make it more likely that they would get at the remainder which were not exceptions. But it must not be supposed for a moment that Part 4 could be carried in the form in which it stood. Purposely the former savings in the old Act were omitted, notably the saving of exempting the City of London, for they considered that it would not be right to exempt the City and to include such districts as the Strand. They were aware that exemptions had been made as to certain classed property, and that no limits of area that could be drawn would meet the question; it must depend on something else than geographical or Local Government limits. In the course of this conference a clue had come, and it was to deal more rigorously with those dwellings which were likely to be tenanted by the poorer classes. They therefore proposed to accept that general suggestion, and to deal severely with that class of dwellings, letting other buildings off comparatively easily. There was one thing which the County Council was aware of—one inherent difficulty in the question. Any restrictions made upon building, in regard to space or anything else, would inevitably displace large numbers of people who now lived in London, and would send them to the suburbs. Indeed, here were many who looked upon this as a serious matter, but personally he did not take that view. The gain to health would be

enormous, although it was quite true that the wear-and-tear of travelling would somewhat things to the other side of the scale. He did not know that he could with advantage go more into detail. Before he sat down it was one thing he wished to say. In the place, he was extremely grateful to the Institute and to its representatives who had given the Committee so much assistance. He knew the experience the labour that such work as given by Messrs. Hall and Rickman involved, and they should be grateful to those gentlemen. The intercourse they had had with them was always been of the most agreeable character, and he hoped that they were not worse friends than when they began, while if some of the spirit of hostility was to some extent removed for one should be very glad. They wished this Bill should be one which should be carried forward with something like unanimity in the case of the various people interested, the professions concerned in building, as well as controlling authority. It was not to be expected that they could always agree, and he mentioned whether the members of the Practice Committee of the Institute had ever been unanimous on any one of the drafted clauses of the Bill. And if that were the case, it likely that the Institute of British Architects would agree with the County Council or that either of them would exactly agree with the Surveyors' Institution, or even Parliament, which might differ from them. But there was one thing on which he must have the opportunity of expressing his regret. It was one point on which he, as a Member of the Committee and the Council, had suffered grievous disappointment at the hands of the Institute and of architects generally. The practical side of architecture, the structural and sanitary sides, were always of paramount importance in his humble opinion there was yet another side of architecture, which was of scarcely less importance—he alluded to the side of art. Now, he had not received any communications what from the Institute, or from any architects, in any of the questions in the Bill which bore matters of art. He would be the last person to suggest that anything in the slightest degree the sense of a censorship or control of art should be exercised by a municipal body; but the question was this, it was very evident to them as practitioners that a set of building regulations might have a tendency to influence architecture in one way or another; it might be adverse to the rest of art, or it might be in favour of it. He no doubt that many of them thought that the County Council did not care the least bit for art, but if they did so, they were making a mistake. He did not suppose there ever was a body of men who, in their ignorant lay way, had a stronger desire to see London beautiful than the London County Council, and that feeling extended even to the extreme labour wing of the County Council. He asked for guidance at the hands of architects but who had never hitherto had it. So interested were they in art, that they deliberately laid down rules allowing architects to have, within certain limits, oriel windows, and they had modified old restrictions about exposed woodwork. I said to be a great hardship that people could have wooden barge-boards and certain decorations for dormer windows, and the Council had introduced a special clause to allow these to be put up within certain limits. Then, again, they had endeavoured to control advertisements, which were by far the greatest enemies of architects. Take the London Circus, for instance. He presumed that that space might have been adorned by buildings of a very high standard of beauty, but as it was a whole thing was one blaze of letters and advertisements, so that instead of being beautiful was hideous to a degree. In fact, there was relief to the eye until one came to the Courts, with the Bank of England on one side and another bank opposite, all being buildings of a public character, with no advertisements to deface them. The Council had endeavoured to control that, but he was sorry to say they received no help from the Art Committee of the Institute. There was one thing only in which they had made provision which might interfere with architects—they had limited the height of cornices to 2 ft., but he thought that was a liberal allowance. There were a great many things which could only be done with the consent of the Council, which might be with the consent of the Building Act Committee and there had been many cases in which, while the thing was objectionable in itself or ugly, they refused to pass it. Some points were referred to having possibly deleterious effect, for instance,



clause about advertisements, which compelled use of fire-resisting materials, might drive the sign-board out of existence and replace it by unmelting iron, which was decidedly ugly. But suggestion had not come from the Art Committee, but he believed from the *Licensed Victuallers' Gazette*. Mr. Cates had objected to streets being 40 ft. wide, with buildings 12 ft. high, but they had received no recommendations as to the height of buildings, and as to ratio of 5 to 4, or 7 to 3, being more consonant with the ideas of beauty. They had only in mind to what sort of advertisements were set on or had. Another point was the question of desirability of having the parapet of the party wall carried above the slates. This he considered desirable and unnecessary in the case of small uses, the party wall going up through the slates being one of the most difficult points to make between the slates and the brickwork.

Mr. John Slater remarked that he had taken a good deal of interest in building legislation, and some four years ago, in that room, he strongly advocated the consolidation and amalgamation of the various Building Acts, and enactment of new provisions which would lead to more solid and sanitary building. He, therefore, welcomed the present Act cordially, because he had evidently been drawn with a sincere fire, on the part of its framers, to do away with great many of the most flagrant abuses now existing. For a great many of the clauses and provisions of the Bill he had nothing but commendation, and he would fully admit that, if they were dealing with new districts only, there were very few of the provisions of the Bill he should like to see taken out. But the experience he had, during the last few years, in erecting buildings in parts of London which had previously been covered with buildings, had led him to the conclusion that, if this Bill was carried without modification, it would prevent at it meant to accomplish, and would retard improvement of many parts of the metropolis. It might take as a sample about one mile in radius from the spot in which they were then assembled. He would, therefore, strongly urge on London County Council—and from the remarks Dr. Longstaff, he believed they would listen to what was said—that they should seriously consider the objections to some parts of the Bill which had been made by Mr. Cates, and which could doubtless be enlarged upon by subsequent speakers. He was glad to hear from Dr. Longstaff that the County Council and their Building Committee were taking the view that the Bill was too stringent to apply in its entirety to all parts of London, because that admission would facilitate matters materially, and aid in getting a really good Bill passed. He agreed with Mr. Cates that there were some omissions in the Bill which it would be desirable to supply. He could not help thinking that the London County Council ought to be empowered to ensure that, in the laying out of new districts, certain portions were permanently reserved as open spaces. Mr. Cates had not, perhaps, the reputation of being a Progressive Radical, but he was evidently in advance of the Council in what he had said on that point. He agreed with Mr. Cates's view, because one could see every single old building in the suburbs, with its garden attached, being pulled down and absorbed by the speculative builder. The County Council by its regulations made laws relating to the width of roads, and he felt confident that the support of everybody who had the interests of the Metropolis at heart would be given to the Council, if they endeavoured to ensure a certain amount of open space in new districts which were laid out for building. Then, again, with regard to public buildings, the provisions relating to these had been improved in the present Bill, these being taken almost verbatim from the provisions of the Manchester Act. At the same time, as far as he was able to see, he could find no regulations which would enable the Council to forbid the erection of public buildings in restricted areas. Now, a public building ought to be erected with an entrance to one street only, but certain open areas could be left at the sides for means of exit. This was referred to in some of the regulations of the Council, but he believed it only applied to cases where there was more than one story in a public building. He could quite imagine a public building being erected without upper stories, where, in cases of panic, immense danger would be caused if the whole audience had to come from the side of the building to get out. Clause 4 of the Bill was, of course, the *crux* of the whole matter, and he had intended to allude to several points in regard to it, but after what had fallen from Dr.

Longstaff it would be quite unnecessary. He only wished he could show him, and many other members of the Council, some of the buildings not very far from that spot, so that they might see and appreciate the immense difficulties architects had to meet with when they had to erect new buildings on old areas, and to appreciate also the improvement they were able to make in those buildings when they were put up. It was all very well to say, as Clause 30 did, that every person who erected a new building should leave a space at the back where the enclosing walls, or anything else, did not exceed 9 ft. in height, or in the case of other than a domestic building, 12 ft. They had frequently to put a building on an old area which was surrounded by walls which were 12 ft., 18 ft., and 20 ft. in height, and it was impossible to carry out the regulations. It was most important that there should be an open area in the rear of the building above the ceiling of the ground floor, but if the ground floor and basement of such building, used for business purposes, had an ample skylight in the rear and proper means of ventilation, it was more healthy than if the open area went right down to the ground and the back windows looked on a wall, the space thus becoming a receptacle for rubbish, and the air in it always stagnant. With regard to business premises, people did not live on the ground floors and basements. If they had open areas above the ground floor in the case of two or three buildings, each building got the combined effect of the light and air, and even in crowded districts they could put up buildings with a clear space in front of the back windows of 150 ft. or more. There was an almost unanimous consensus of opinion as to the impossibility of some of the regulations in the Bill, and he claimed for architects that they were practical men, actuated with as keen a desire as any member of the County Council to ensure healthy conditions for the people. He, therefore, asked the Council to consider the objections he had raised on those points of the Bill, and to endeavour either to give them up, or to put enabling clauses in, so that if they could not carry out exactly what was desired, they might approve of something which would undoubtedly improve the property as it now existed. With regard to the question of construction, it was impossible to go into all the points mentioned in the Bill, but he would plead for more discrimination being allowed to persons who had to carry out the regulations. In fact, he thought the Council would be playing into the hands of the speculating man if they put down strict and literal definitions of what they wished in matters of construction. Take the question of foundations. No architect would have a decided opinion upon the depth and width of the concrete under the footings of a building, unless he had first seen the ground; and do what they would, they could not meet all the cases they would have to deal with. With regard to the foundations, he held most strongly that the best orders they could give would be that no footings were to be placed under any new building until the District Surveyor had seen and approved the foundations. That would be on all fours with what was done in the case of drains by the vestries. The vestries now said, with regard to the laying of drains, that they should not be covered up until they were inspected, and he saw no reason why a competent District Surveyor should not say that he would not have the footings put in until more earth had been taken out. With regard to the walls, he believed, strictly speaking that, if the conditions of the Bill were read literally, they could not put a wall on a bressummer at all, and no doubt some modification would be made on this point. As to the tribunal for appeal, he strongly advocated such a tribunal in the paper he read some time back, and he could not help thinking that the abortive Act of 1850, which proposed that one legal assessor, and one architect or surveyor, should form a court, seemed a very good plan. But if they did not agree to that he would urge them not to make the Court of Appeal too cumbersome. They would get decisions, which were more to be relied upon, better with a tribunal of three than with one of five. The tribunal of appeal was a most important thing, but he hoped it would be slightly modified and that they would have a better tribunal even than five members would constitute. He would conclude by saying that he had now got the chance of having what he believed would be a thoroughly good Bill, and it behooved them all to try to do what they could to make it better. But with regard to the remarks which fell from Dr. Longstaff as to the reasons why the County

Council were pushing the Bill forward rather hurriedly, he would venture to ask him to reconsider that. It was far better to wait one or two years and have a really good Act than that a Bill of this immense importance should be hurried through Parliament, and then that they should find, as had been found before, that they had to amend the Building Act again because they had left something out. If the County Council agreed to that, no doubt they might have a Bill which would be of immense advantage, both in respect to making London more sanitary in every way, and at the same time more beautiful. Mr. Slater concluded by moving a vote of thanks to Mr. Cates for having brought the matter before them so ably and so succinctly.

Mr. W. Bruce, as Chairman of the Housing Sub-Committee of the London County Council, thought it might be convenient to state to the meeting what were the considerations and experiences which had led them to press forward Part IV. of this Building Act. Mr. Cates had intimated that, in one or two respects possibly, they were visionary people, but they would be disappointed if they expected to find that he, the speaker, was a "dreamer of dreams," or anything of the kind. It was purely from practical considerations that it had struck them that the old Building Act failed so absolutely, when taken into consideration with legislation which had since come into force. Since 1886 two important Acts had been passed by Lord Salisbury's Government, the Housing of the Working Classes Act, 1890, and the Public Health Act, 1891, and, as a matter of everyday practice, he had found they clashed continually with the old Building Acts. Under the Building Act, a building might be erected, which the County Council might at once be compelled to destroy at the public expense, because it was an insanitary building under the other two Acts; and that was hardly a thing that should be allowed to continue. This was the main point he would call attention to, and was at the bottom of Part 4. As an illustration of what was going on under the Housing of the Working Classes Act, when the sanitary authorities declared that, through closeness or bad conditions, the houses within a certain area were dangerous to the health of the inhabitants, then the London County Council could be called upon to buy up the whole of that area, clear off the buildings, reduce it to bare land, reorganise new streets, and build houses again on those streets, either themselves, or by getting others to erect them. That was at the bottom of the whole thing. They had only to carry out the Acts recently passed, and the Building Act should be framed with a consideration for those Acts. Then the Public Health (London) Act, 1891, enacted that when a dwelling-house was dangerous and injurious to health the Local Authority could get a closing order; but in stepped the old Building Act, and said that the owner might rebuild it so as to make it a far more insanitary house than it was before, by raising it to five stories instead of two. Under the Housing of the Working Classes Act, 1890, an area of 15 acres in Bethnal Green had been notified, and the County Council had to buy up the whole of the interests in that ground. The original claims for compensation were £457,000, which, after much negotiation, were settled for £216,000, but the net loss to the people of London for the clearing of that area, after allowing for the value of the land as it stood, was 265,000l. Under the Building Act those unhealthy areas were growing up all over London, and the County Council could be called upon to destroy them at the cost of the people of London. That was the difficulty the County Council were in, for they had been called upon to consider no less than 70 areas, and the Building Act was actually producing that result over two-thirds of the metropolis. Several areas were now being cleared, at an immense cost to the people of London, therefore, he would ask whether they could not seriously consider as to some regulations being drawn up to prevent a recurrence of this absurd expenditure.

Mr. Campbell Douglas said that as he was seldom present at these meetings, it was a very interesting thing to find them in all the throes of a controversy which they in Glasgow had gone through, with a population about one-seventh of that of London, and with a great number of the difficulties which Londoners were now grappling with. These difficulties were, of course, several times increased in London, in quantity, if not in degree. There was one thing which struck him, and on which he might be pardoned making a remark, though he might be told, at the same



time, that it did not concern him. He did not see that there was any proper and clear understanding about money compensation to proprietors for the improvements proposed to be carried out, and that he considered should stand on the very forefront of the undertaking. A provisional order was intended to be got in Glasgow some ten years ago, against which he gave evidence as to its absurdity, the result being that the Sheriff of Lanarkshire eventually laid it aside and it was refused to be passed, as it was felt to be tantamount to confiscation to take ground from proprietors. Though a disciple of the Radical school, he would never think of taking any ground from a man without paying for it, and if this was not fairly gone about in the present case, the London County Council Bill would be shipwrecked by that alone. Allusion had been made as to the Art Committee giving the County Council the benefit of their advice and suggestion, and he understood that cornices were not to be allowed with over 24 in. projection. To his mind it was ridiculous to limit a thing in that way, it being a question which referred to the particular building the architect had in hand.

Mr. Hall, who was called upon by the President, moved the formal adjournment of the discussion till next Monday at 8 o'clock.

The President referred to the pleasure he had received in listening to the interesting addresses delivered by the members of the London County Council. He also expressed his gratification in finding, from the able and exhaustive address of Dr. Longstaff, that very material concessions were to be made on the part of the Council, in deference to what had been laid before them by the Institute. The meeting would be adjourned until that day week, and on Monday, April 9, a paper would be read by Mr. Thomas Blashill on "The Council Chamber and its Accessories."

The proceedings then terminated.

#### ARCHITECTS' BENEVOLENT SOCIETY.

THE annual general meeting of the subscribers and donors to the fund of this Society was held on Wednesday afternoon in the Council room of the Royal Institute of British Architects, Mr. W. Hilton Nash occupying the chair in the unavoidable absence of Mr. J. Macvicar Anderson, the President of the Society.

The annual report of the Council, read by Mr. Percivall Curry, the hon. secretary (*pro tem.*), was as follows:—

"The Council of the Architects' Benevolent Society have much pleasure in submitting their annual report of the progress of the Society during the past year, as both with respect to capital and income a considerable advance has been made towards that position of stability which it is desirable should be attained.

Advantage was taken of the necessity for reprinting the Red Book to bring the Society more prominently under the notice of those who had not as yet given it support. The Red Book, accompanied by a special appeal from the honorary treasurer, was accordingly sent to every member of the Royal Institute of British Architects, and to the profession generally throughout the country, in the hope that by thus making the Society better known, the funds at its disposal would be largely increased by the contributions of the more successful members of the profession, who might realise the great benefit which the possession of ample funds would enable the Society to confer on their less fortunate brethren who might become by affliction or misfortune fitting recipients of its aid.

It must be frankly confessed that the direct result of the labour and expense incurred in making this appeal did not realise the anticipations which had been formed, but there is reason to believe that much indirect effect has been produced which will in future benefit the Society. The financial result has been the receipt of 357. 18s. in donations, and of new annual subscriptions to the amount of 62. 10s.

As an instance of the possible result of individual exertion, the Council have pleasure in mentioning that one of their members obtained 50l. 8s. in donations and 8l. 8s. from new annual subscriptions. Apart from wishing to give expression to the Society's obligation to him, this is mentioned with the hope that other members of the profession may with the same exertion to exert in like manner their personal influence to increase the funds of the Society.

With reference to the financial position of the Society, the statement of accounts shows that, including the payment of three pensions (70l.), a total amount of 457l. has been distributed among thirty applicants for relief (as against 420l. in 1892), while 170l. has been transferred from cash account income to capital account (as against 100l. in 1892). The income derived from investments was 279l. 6s. 9d., and from subscriptions 377l. 17s., the entire available receipts during the year 1893 being 779l. 1s. 7d.

By the investment of the legacy of Mr. John Gibson (500l.), together with donations and the

amount transferred from the income account, the Council have been enabled to increase the Society's holding of 100l. Four per cent. Caledonian Railway Debenture Stock to 1,450l.; so that the entire investments now represent 8,050l. in Consols and Railway Debenture Stock, which have been purchased at a cost of 9,363l. 2s. 10d. and which are estimated at current market value at 10,375l.

It should be mentioned that it has recently come to the knowledge of the Council that the late Mr. J. H. Good bequeathed a sum of 100l. to the Society, subject to a life interest in his estate. In this connexion the attention of intending benefactors may be directed to the form of bequest printed at the end of the list of subscribers.

The Council, with great regret, announce the resignation of Mr. William H. White, as honorary secretary, in consequence of his greatly increased duties in connection with his position as Secretary of the Royal Institute of British Architects. While making this announcement, the Council desire to place on record their high appreciation of the services which Mr. White has rendered to the Society, and their conviction that the progress made during his thirteen years' tenure of the office has been largely due to his active influence and energy.

As Mr. White's resignation took effect subsequent to the last annual general meeting, Mr. Percivall Curry kindly consented to undertake the duties of honorary secretary until the present meeting. He having expressed his willingness to devote his time and energy to the advancement of the interests of the Society, the Council have much pleasure in recommending his election to the vacant position.

Mr. R. Dircks, assistant librarian of the Royal Institute, has been appointed assistant secretary of the Society in place of Mr. Verity.

The following gentlemen, being the five senior members, retire, under the provisions of By-law 43, from the Council:—Mr. Fred. Chancellor, Mr. Rowland Plumbe, Mr. Augustus W. Tanner, Mr. H. H. Collins, and Mr. Thomas Harris. To fill the vacancies caused by these retirements and that caused by Mr. Percivall Curry's acceptance of the post of honorary secretary, the Council have the pleasure to nominate Mr. William Grellier, Mr. E. B. I'Anson, Mr. E. H. Martineau, Mr. T. M. Rickman, Mr. R. St. Aubyn Roumieu, and Mr. J. T. Wimperis, all of whom have consented to serve if elected.

The balance sheet and income account for the year ended December 31, 1893, audited by Mr. W. Kidner and Mr. W. Grellier, are herewith submitted.

The Council cannot close this report without expressing the obligations of the Society to the Royal Institute of British Architects for the hospitality afforded in allowing the Society the use of their rooms for the meetings, and for continuous acts of courtesy and kindness on the part of the Institute and its officers, which have materially assisted the business of the Society.

The hon. treasurer, Mr. Arthur Cates, read the statement of accounts and balance-sheet.

The Chairman, in moving the adoption of the report and accounts, said that, on the whole, they were very satisfactory. He thought it ought to be mentioned that it was owing to the energy of Mr. T. Harris that the sum of 50l. 8s., mentioned in the report, had been obtained. He was sure that they were all sorry to lose the services of Mr. White as their hon. secretary, for he had been so long connected with the Society that he seemed to have become part of it.

Mr. George Scamell seconded the motion, which was agreed to.

Mr. D. C. Nichols moved, and Mr. J. T. Wimperis seconded, a vote of thanks to the outgoing members of the Council, Messrs. F. Chancellor, Rowland Plumbe, A. W. Tanner, H. H. Collins, and T. Harris. This having been agreed to, Mr. G. Scamell moved, and Mr. H. L. Florence seconded—

"That the President of the Society be the President, for the time being, of the Royal Institute of British Architects, and that Messrs. W. Hilton Nash, J. G. Finch, J. J. O'Connell, Andrew Oliver, Charles J. Shoppes, Arthur Ashbridge, Thomas Blashill, J. Henry Christian, Sydney Smirke, Wm. Grellier, E. B. I'Anson, E. H. Martineau, T. M. Rickman, R. St. Aubyn Roumieu, and J. T. Wimperis be elected members of the Council."

The resolution having been agreed to,

On the motion of Mr. A. W. Tanner, seconded by Mr. Florence, cordial thanks were voted to Mr. Arthur Cates for his services to the Society, and he was unanimously re-elected treasurer.

Mr. Cates briefly replied.

Mr. E. B. I'Anson then moved, and Mr. L. Solomon seconded, that the thanks of the Society be presented to Mr. Percivall Curry for his services as hon. secretary during the past year, and that he be re-elected to that office.

This was agreed to, and Mr. Curry replied.

On the motion of Mr. Cates, seconded by Mr. Tanner, a vote of thanks to Messrs. W. Kidner and W. Grellier, the auditors, was agreed to.

Mr. L. Solomon then moved, and Mr. E. I'Anson seconded, that Messrs. T. Harris and G. Scamell be elected auditors for the ensuing year.

The motion having been agreed to, Mr. Cates proposed a vote of thanks to the Royal Institute of British Architects for affording office accommodation to the Society. Mr. Curry seconded, and the motion was agreed to.

Mr. W. H. White replied on behalf of the Institute.

On the motion of Mr. Scamell, seconded by Mr. Tanner, a vote of thanks was passed to the Chairman, and the proceedings terminated.

#### THE LONDON COUNTY COUNCIL.

THE usual weekly meeting of the London County Council was held at the County Hall, Spital Gardens, on Tuesday, March 13, Mr. A. Arnold presiding during the earlier part of the proceedings.

**Election of Officers.**—The first business of the sitting was the re-election of Messrs. John Huddell, Charles Harrison, and W. H. Dickinson to the offices of Chairman, Vice-Chairman, and Deputy Chairman respectively. Committees for the ensuing year were also re-elected.

**Paving and Sewer Works, Boundary-street.**—The adjourned report of the Public Health and Housing Committee relating to this matter was considered. The report was as follows:—

"The plan for the laying-out of the Boundary-street area having been formally approved of by the Home Secretary, it becomes necessary to decide what material shall be used for paving the streets. The engineer has submitted to us estimates of the cost of paving, including the provision of trees and the formation of sewers. They are as follows:—

Paving carriageways with wood and footways with York stone (including trees and sewers) .....	44
Paving carriageways with granite cubes and footways with York stone (including trees and sewers) .....	52
Paving carriageways with asphalt and footways with York stone (including trees and sewers) .....	54
Paving carriageways with macadam and footways with York stone (including trees and sewers) .....	54

"We have at once dismissed from our minds the idea of macadam, it being noisy, dusty, dirty, expensive to maintain. We consider that wood or asphalt should be used, as there is likely to be enough vehicular traffic through the area (except in the new street between High-street, Shoreditch, and Boundary-street, which includes site of Calvert-street, and with which we treat another paragraph), to make granite desirable, and asphalt is the most suitable from a sanitary point of view, as it can be easily cleaned. Although there will be considerable yard space between blocks of dwellings, yet we consider that the street will be largely used by children, and in view of the fact that wood becomes readily contaminated by horse droppings and remains for some time, it is not so suitable in our opinion as asphalt. We have hesitated before recommending so expensive a paving, but after duly weighing the advantages of asphalt as against the increased cost, we recommend—

"That the carriage-ways in the area comprised in Boundary-street, Bethnal-green, where the adoption of the proposed road between High-street, Shoreditch, and Boundary-street is paved with asphalt, and the footways with granite, and that the engineer be instructed to prepare plans and specifications accordingly."

Mr. Antrobus moved that the recommendation be referred back, with an instruction that wood and not asphalt should be used.

Mr. Marsland seconded, but the amendment on a show of hands, was lost, and the recommendation of the Committee agreed to.

**Electric Lighting of the Victoria Embankment.**—The following adjourned report of the Highways Committee was next considered:—

"The Council on February 13 referred the subject for further consideration and report a recommendation which we then submitted with reference to the laying of the conduits and the formation of the lamp columns in connexion with the electric lighting of the Victoria Embankment. Objection having been raised to the proposed place the columns in the centre of the carriage-ways—

"We may state that when the subject of electric lighting of the Embankment was before us, we gave very careful consideration to the question of the position of the lamp-columns: in our report to the Council on June 21, 1890, we stated that we proposed 'that lamps of from 1,200 candle-power should be placed in the centre of the road at about fifty yards from each other. The Council adopted our recommendation a

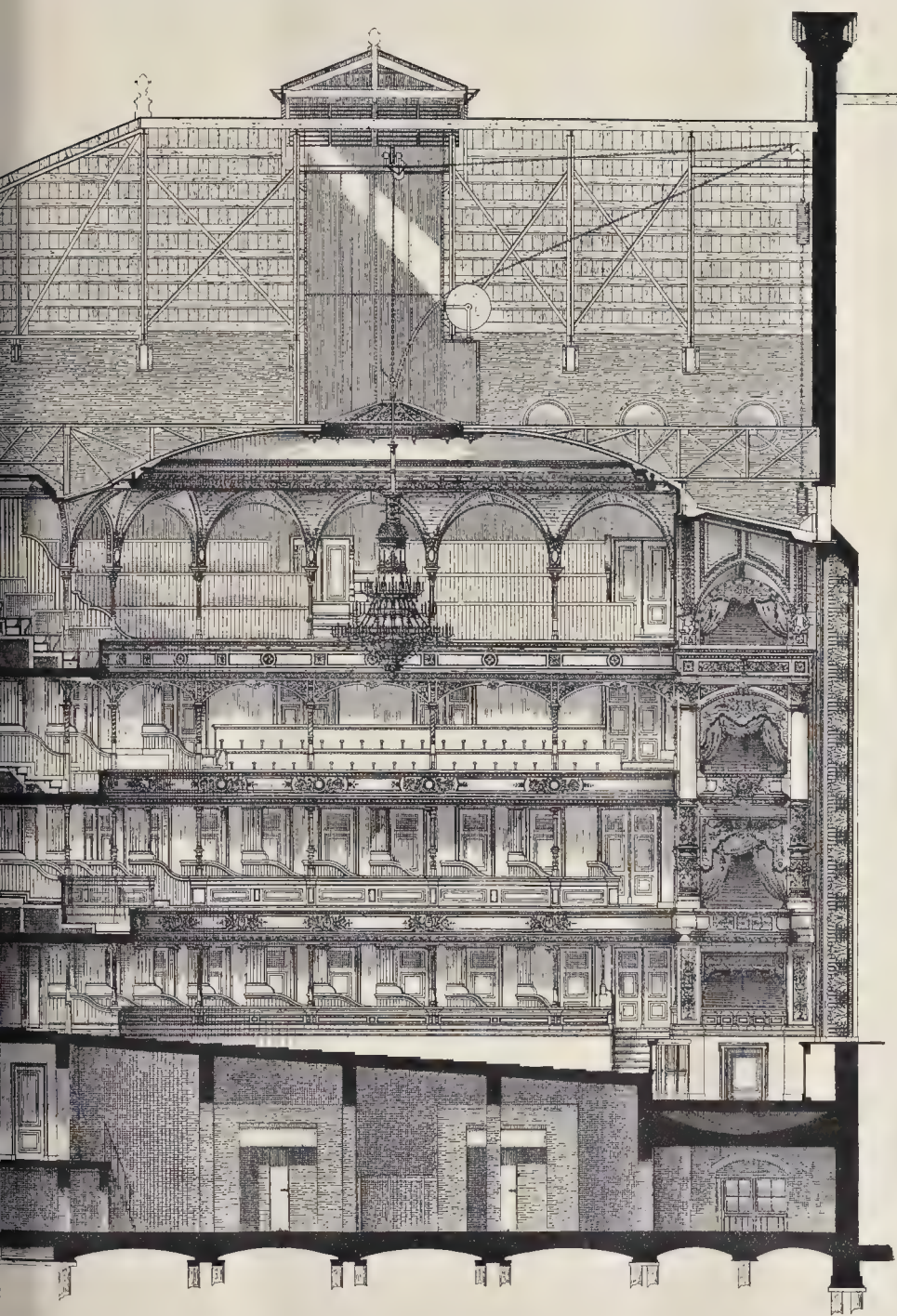




NEW THEATRE, ROTTERDAM.

HERR J. VERHEUL, ARCHITECT.





TION.  
PS





following meeting, an amendment to refer it back to us 'for further consideration, especially on the point of the distribution of the lamps,' having been rejected.

We think it well now to give some of the reasons upon which we based our opinion that the best arrangement for lighting the Embankment is for the lamps to be placed in the centre of the carriageway. If the electric lamps were to be placed along the kerb on each side of the carriageway it would be necessary either (a) to use very lofty columns for the lamps, or (b) to cut the trees in order to allow of the lamps being fixed in the desired positions. Should the former alternative be adopted, the trees would still be left to light from large portions of the road and kerbs, while the adoption of the second would involve a mutilation of the trees, which would greatly detract from the picturesque appearance of the Embankment. In some of the Continental cities the lamps are suspended by means of wires or cables; and this method necessitates the placing of standards in the carriageway to support the wires, except in the case of narrow streets, where other means are adopted. Should these necessary supports be placed in the Embankment against the kerbs, the span would be so great, on account of the width of the carriageway, that the lamps would be unsteady in the slightest breeze, and this would seriously diminish the effectiveness of the light. Owing to the width of the road it would be almost impossible, and certainly inadvisable, to erect arches or fix standards on standards for the purpose of carrying the lamps.

Having again given very careful consideration to the matter, we have come to the conclusion that the most objectionable and the most advantageous method of distributing the light over the Embankment will be by the erection of ornamental lamp columns, each with a small cage round it, not exceeding 4 ft. in width, in the centre of the carriageway. This is at no part less than 64 ft. in width from kerb to kerb, and there would be left on each side of the refuge a space of 30 ft. We see no reason for altering the recommendation which was referred back to us on February 13, which accordingly we again submit, as follows—

'That, subject to an estimate being submitted to the Council by the Finance Committee, as required by the Statute, the work of laying the necessary conduits and the wiring of the lamps, and the lamp-columns in connection with the electric light installation for the Victoria Embankment, &c., be carried out by the Council without the intervention of a contractor; and that the plans, specifications, and estimate be referred to the Works Committee for that purpose.'

Mr. Roberts moved an amendment to the effect that it was undesirable that lamp columns should be placed in the centre of the roadway of the Embankment. It was absolutely unnecessary to fight the Embankment in the manner proposed, and if they did so it would show that they had no sympathy with the architectural beauty of London.

Mr. J. W. Benn, M.P., seconded the amendment, which was supported by Mr. John Burns, M.P., Mr. Beresford Hope, and others, and ultimately adopted.

**Wellington-street and Strand Widening.**—The Improvement Committee reported as follows—

'Some time back the Strand District Board stated that the premises at the corners of Wellington-street and the Strand, the southern side of the Strand were about to be pulled down, and suggested that the Council should avail itself of the opportunity thus presented for widening the Strand and Wellington-street. We are not prepared at present to deal with the setting back of the eastern side of the street, but we propose to confine this report to the property on the western side.

Wellington-street at its junction with the Strand is at present about 64 ft. wide, and the Strand at this point has a width of about 68 ft. Owing to the inadequate width of the road the traffic is frequently congested, and we feel confident that the Council will be ready to entertain any proposal for remedying this at a moderate cost. We have ascertained that the property required for setting back the western side of Wellington-street to the line of Lancaster-place and for rounding the corner at the junction with the Strand is the freehold of the Duchy of Lancaster, and that most of the leases will fall in at Christmas, 1896, others in 1903 and 1918, and one in 1931. The Duchy is willing to sell to the Council, subject to the existing leases, the reversion to the freehold of this property, containing an area of 7,219 sq. ft. By adding the land to the public way the width of Wellington-street between the Strand and Lancaster-place would be increased to about 100 ft., and the Strand between Wellington-street and Savoy-street would be at least 80 ft. wide. The price asked by the Duchy is 32,000*l.*, and the following conditions are attached to the offer:—

(a) As the valuation of the Duchy's interest has been made on the assumption that the money will be paid in March 25 next, interest at 4 per cent. per annum from that date until actual payment will be required. (b) Immediately any of the pieces of land come out of lease, or the buildings or parts of buildings on such piece of land are previously removed, the

Council shall add such piece of land to the public thoroughfare, and shall at the expense of the Duchy form, under the new footway and in accordance with the regulations or requirements of the local authority, such vaults or cellars as the Duchy may require for use in connexion with the buildings on the adjoining Duchy land, and shall assure the free use of such vaults or cellars to the Duchy in perpetuity. (c) Immediately the piece of land at the corner of Savoy-street and the Strand comes out of lease, or the part now standing thereon of the house now numbered 125 in the Strand is previously removed, the Council shall, at its expense and to the satisfaction of the surveyor general of the Duchy, build on the new line of frontage a new north wall for the residue of the said house. (d) The Duchy shall not be liable to see to the performance of any covenant on the lessee's part contained in any of the existing leases, or be under any responsibility to the Council with respect to any building or part of a building included in the sale to the Council. (e) No claim or question of 'betterment' in respect of this particular improvement shall be raised by the Council as to any part of the block bounded by Wellington-street, the Strand, Savoy-street, and Lancaster-place, which might be held to be affected by the contemplated improvement. We consider these terms favourable to the Council, especially when it is remembered that the Council will be saved all outlay for compensation in respect of leasehold and trade interests, and will only have to pay the value of the land to be added to the public way. The estimated cost of the paving works is 2,700*l.* The widening of Wellington-street will have to be undertaken at some time, and we are convinced that it can never be done so inexpensively as at present. Having regard to the very favourable opportunity now presented for effecting this much-needed improvement at the least possible cost, we recommend—

'That, subject to an estimate being submitted to the Council by the Finance Committee as required by the Statute, the Council do accept the terms and conditions of the Duchy of Lancaster for the reversion to the freehold of the property required for widening Wellington-street and the Strand, and do carry out the improvement as shown upon the plan submitted with this report; and that the solicitor be instructed to prepare the necessary agreement with the Duchy.'

The consideration of the report was postponed.

**A Ground Plan of London.**—It was resolved to spend a sum not exceeding 500*l.* as a preliminary step towards the preparation of a ground-plan of London, showing the various freehold interests.

At a quarter to eight the Council adjourned until Friday.

## ENGINEERING SOCIETIES.

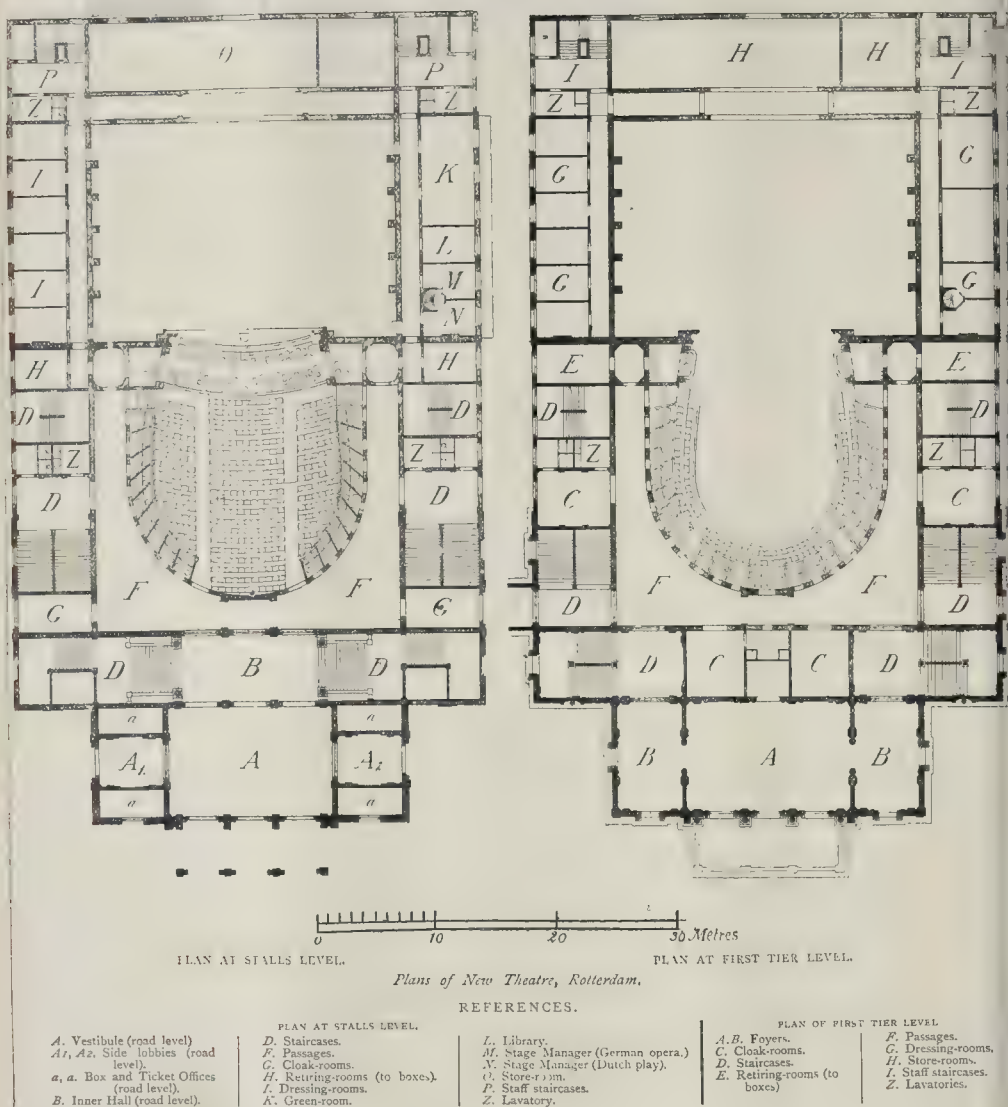
**THE CIVIL AND MECHANICAL ENGINEERS' SOCIETY.**—A paper on the subject of 'Electric Lighting in Country Houses' was read by Mr. Sydney A. Court at an ordinary meeting of the Civil and Mechanical Engineers' Society, held on the 15th inst. at the Society's rooms in Delahay-street, Westminster. Commencing with the consideration of the various sources of power suitable for generating electricity, the author referred to an interesting installation at the private residence of Mr. H. C. Brush, in America, where a self-regulating windmill is in use charging a huge battery of storage cells. Motive power derived from water, gas, and oil engines was discussed; and attention drawn to the necessity for the proper training of the electrician in charge of works, who although, as a rule, in sole charge of plant and apparatus costing from 1,000*l.* is often not paid more than thirty shillings a week, while his want of knowledge or carelessness in attending to the storage battery alone—an expensive item—may occasion its loss in a very short time. The design of small installations was next considered, and stress laid upon the necessity of their being under the control of a consulting engineer, who, by his independent position and freedom from connexion with manufacturers and contractors, is able to consider each case strictly on its local requirements and conditions. Examples of the annual cost and working expenses of small installations were given, and attention drawn to the advisability of using incandescent lamps of high efficiency, as the doing so effected a considerable economy in the yearly cost of working.

**THE INSTITUTION OF CIVIL ENGINEERS.**—At the ordinary meeting of this Institution on the 13th inst. Mr. Alfred Giles, President, in the chair, a paper was read dealing with 'The Prevention and Detection of Waste of Water,' by Mr. Ernest Collins, M.Inst.C.E. Waste of water, said the author, comprised—(1) Visible waste above ground, caused by defective mains or pipes, or by unsound and unsuitable house-fittings. (2) Hidden waste, arising from broken pipes underground, or from faulty mains and

services, where the water escaped unperceived and found its way into sewers or disused drains; also that arising from secret overflows from baths, cisterns, underground tanks, gas-engine coolers, &c. (3) Wilful waste caused by leaving taps open and tampering with fittings. (4) Undue consumption of water, which, although used wastefully, was serving some useful purpose. The first two kinds of waste could be dealt with by systematic inspection, constant supervision, and the employment of suitable appliances, and the employment of suitable appliances. Wilful waste was difficult to discover, whilst it was still more difficult to find the offender; and it was most difficult to obtain a conviction of the offender when found. Undue consumption was difficult to define; what some might hold to be unnecessary consumption, others would consider a legitimate use of water. Among fittings which caused undue consumption, the automatic flushing-tank was a very objectionable form of apparatus. Another frequent cause of undue consumption was the faulty design of closet-pans, which should be so constructed that the jet of water might act on the soil to be displaced in the direction of the outlet. Where this was carried out the regulation allowance of two gallons at each flush would suffice. Hydraulic motors, lifts, and elevators, when worked off comparatively low-pressure mains suitable for ordinary domestic or trade supply, occasioned undue consumption. Ornamental fountains and careless garden-watering also gave rise to undue consumption and, in some cases, wilful waste. One of the chief means of preventing waste was the introduction of thoroughly efficient fittings into the houses of consumers. The regulations made with the approval of the Board of Trade, under the Metropolitan Water Act of 1871, were among the main difficulties which embarrassed Water Companies in London. Many of these regulations were in themselves good, but were so hedged by precautionary clauses as to render them frequently abortive. In 1883 the directors of the New River Company were called upon by the Local Government Board to transfer certain districts within the area of their supply, containing about 22,000 old houses, from the intermittent to the constant system. Attention having been directed to their responsibility and to the difficulties which would have to be encountered, especially in the provision of suitable water-fittings, they empowered the author to introduce a system of testing and stamping fittings, with a view to aid consumers to obtain good fittings and to protect them from the annoyance and loss resulting from the use of inferior apparatus. The system then introduced had developed extensively; and there had been a material improvement in the quality of the fittings. Manufacturers who were at first antagonistic had become strong supporters of the system; so much so that the use of untested and unstamped fittings was, in the district of the company mentioned, almost the exception; and where such fittings were used, they were invariably of the same strength and proportions, and in accordance with the regulations adopted by the company. The Deacon waste-water meter was that most generally in use; it was compact, easily regulated, and fulfilled generally the requirements. The waste-water meter enabled an inspector to see at a glance the precise locality in any district where waste was taking place. The expense of the introduction of the system was considerable—the author's experience showing that, in many districts in London, it involved an outlay of about 150*l.* for every 1,000 houses so controlled. This sum included the cost of the meters and of fixing them on a by-pass, with sundries incidental to the fixing of valves for isolating the divisions of the district. In laying out districts for the waste-meter system, care should be taken that the district to be controlled by the waste-meter was not too large. The author had found from experience that a 4-in. Deacon meter could well control about 400 to 500 houses; but districts smaller than this were desirable. The author proceeded to describe in detail the system adopted by him for the efficient working of the waste-water meter system. By means of this system he had, dealing with an estimated population of 87,000 in Shoreditch, effected in the course of three years a diminution of waste and undue consumption amounting to 720 million gallons per annum.

**GOOD FRIDAY WEEK.**—Next week we go to press a day earlier than usual. All communications for the Editor should reach him by first post on Wednesday morning, except lists of tenders, which will be received up to 10 a.m. of the same day.





### Illustrations.

#### THE CONSISTORY COURT, CHESTER CATHEDRAL.

**A**T the western extremity of the south aisle of the Cathedral is the broad base of a contemplated tower, begun not very long before the Reformation, but never completed. This is now used as the Consistory Court of the Diocese; the view represented is from the aisle, to show the picturesque entrance and Jacobean ornament, bearing the date 1636 in front of the central finial. Through the open door are seen the quaint oak Jacobean fittings, comprising a massive square table, about 9 ft. by 8 ft., surrounded by the proctors' seats within a panelled enclosure which forms the backs. In front, immediately under the west window, is the Chancellor's seat raised on a platform about 2 ft. above the floor, having a very richly-carved back and canopy. A

\* This is the correct title of the plate: by an inexcusable mistake of the lithographer the title of another drawing by Mr. Ivison, recently published by us, has been affixed to this plate. The proof was passed by the Editor with the correct title on it.

peculiar feature is the chair perched high up on the angle of the panelled enclosure; when the Ecclesiastical Courts had jurisdiction over the moral conduct of the citizens this was the delinquent's seat; it is now supposed to be the witness's chair, but never used. The Court is lighted by large perpendicular windows on the south and west sides, and here, under the Presidency of the Chancellor of the Diocese, faculties are decreed for structural alterations required in the parish churches of the Diocese, and questions in Ecclesiastical law decided.

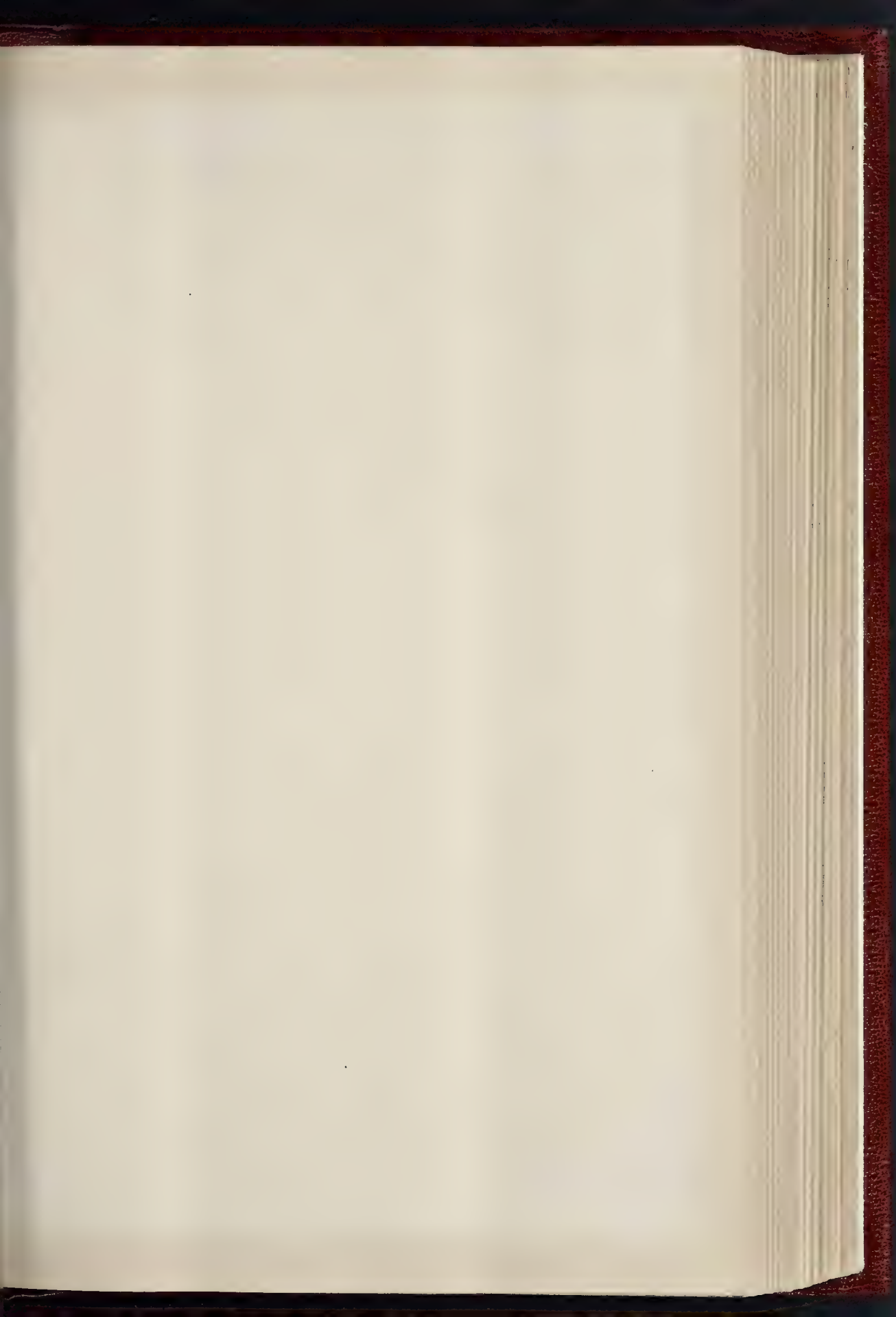
The Consistory Court was formerly held in the Lady Chapel at the east end of the Cathedral.

#### ROTTERDAM THEATRE.

The new theatre at Rotterdam has to be alternately at the disposal of an operatic and a dramatic company, who both have their offices in the block. The building was erected from the designs of Mr. J. Verheul, of Rotterdam, to fulfil the requirements of these two classes of play, a somewhat difficult problem, as the *finesse* of a tragedy or comedy is generally lost in an opera auditorium, in the same way as the actual scenery requisite for a dialogue is lost behind a pro-

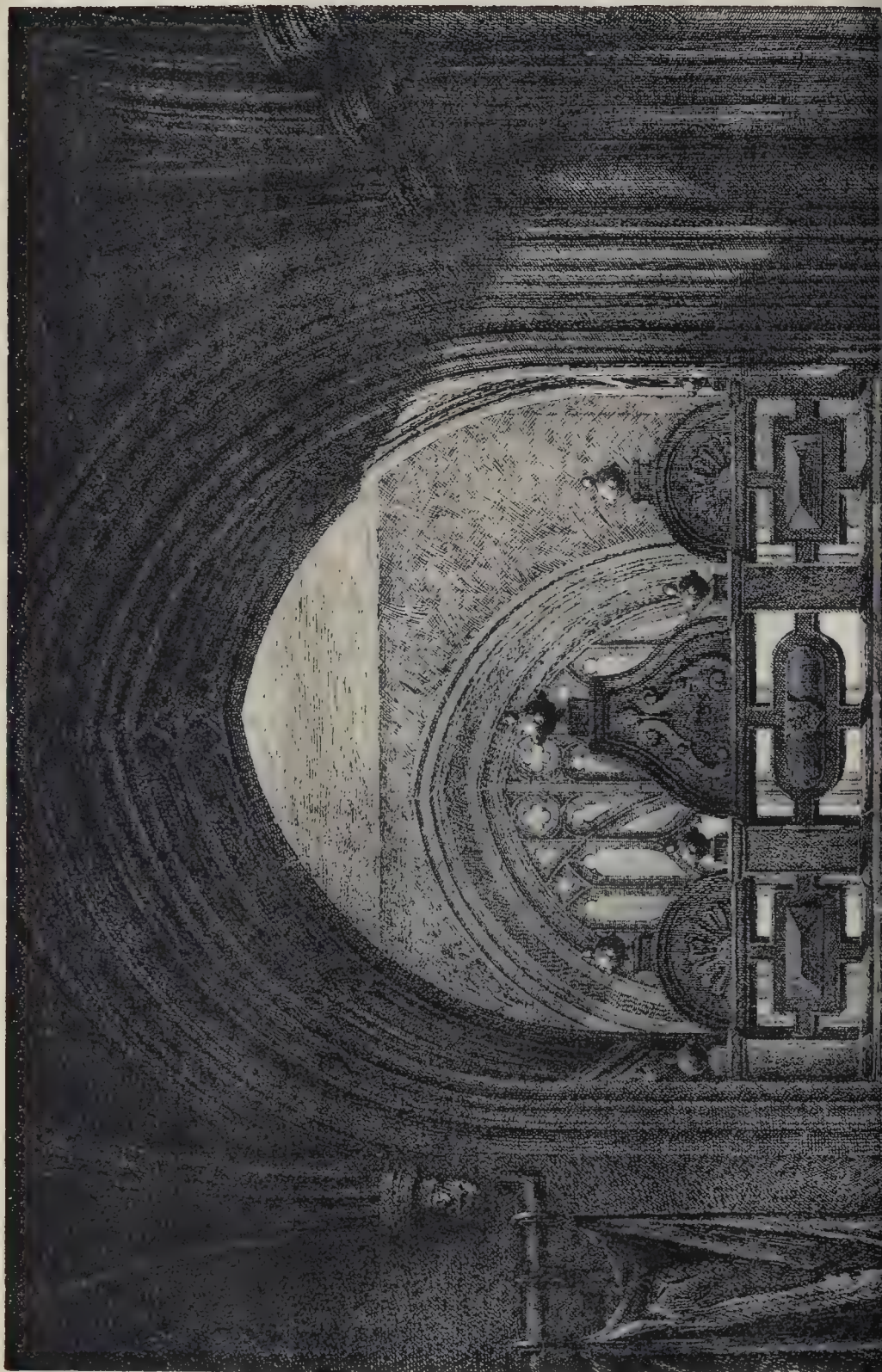
scenium built to frame a full opera with its ballet. The building had the advantage of an open site allowing of essentially symmetrical planning, at the funds were forthcoming to make the building "monumental" in construction and design. In the case of Mr. Baes, the architect of the Brussels Theatre, Mr. Verheul was to a great extent able to take such initiative as he considered advisable for ensuring the safety of those who were to use his building and, as has been generally the case abroad since the Ring Theatre fire, the proprietors entered heart and soul in the effort to make the building a model one.

In examining the plans of Mr. Verheul's theatre we should remember that they actually date from 1883, as the foundations of the building were laid in 1884. This is, hence, a good deal earlier than the Paris Opera Comique fire, which had so much influence on the latest examples of theatre planning. In 1883 there was only the commencement of that movement which the Vienna fire occasioned, and theatre architects and public bodies had only begun to realise the responsibilities. As dating from that period there is little doubt that the plans were far above the average.





THE BUILDER, MARCH 17, 1894







THE ANCIENT CHAPEL OF THE EPISCOPAL PALACE, CHESTER.—DRAWN BY MR. T. P. IVISON

*Chapel of the Holy Spirit  
Episcopal Palace, Chester  
1893*









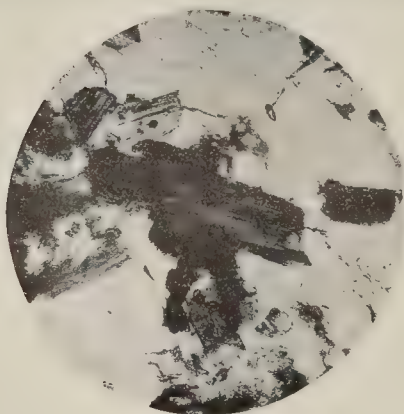


Fig. 1.—GRANITE. Carnsew, Cornwall

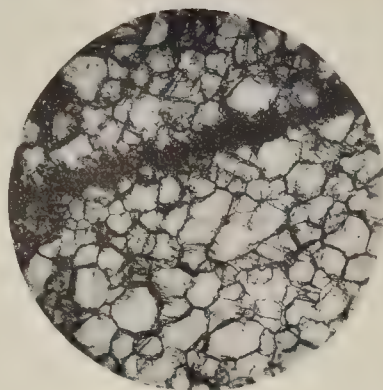


Fig. 2.—MARBLE. Carrara, Italy

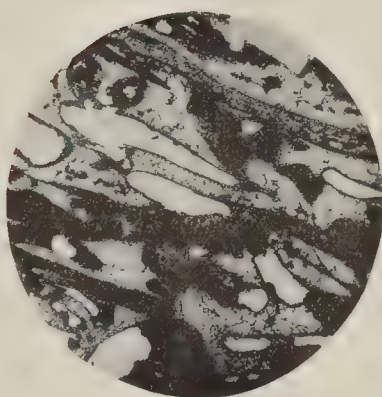


Fig. 3.—BANDED SHELLY LIMESTONE  
Ham Hill, near Yeovil

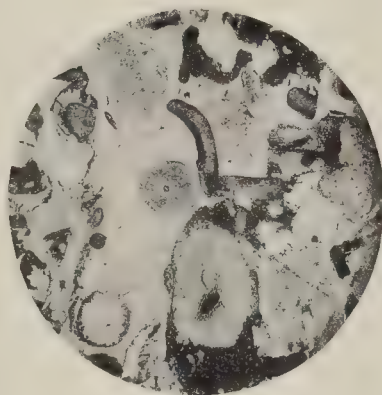


Fig. 4.—FRAGMENTAL LIMESTONE  
Doultong (Chelynych bed), Somerset

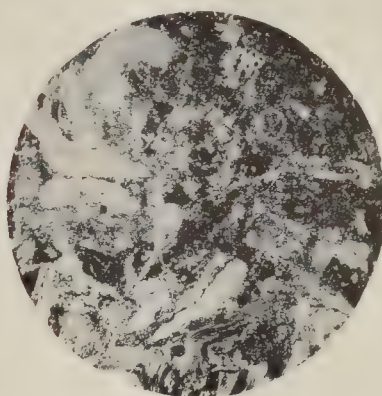


Fig. 5.—VERY HARD LIMESTONE  
(Organically formed), Charfield, Gloucester

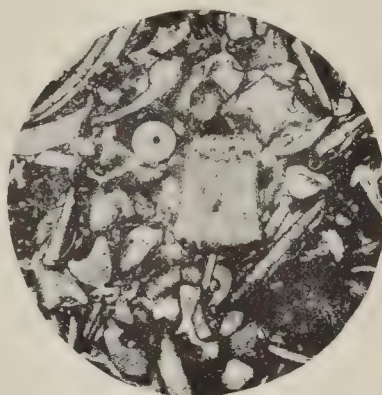


Fig. 6.—SHELLY LIMESTONE  
Bath Stone, Westwood (Paving bed)

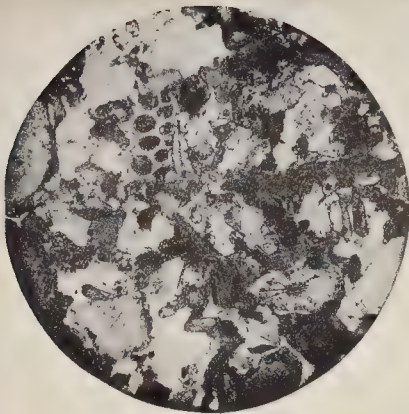


Fig. 7 ORGANIC FRAGMENTAL LIMESTONE  
Doulting (Brambleditch bed), Somerset

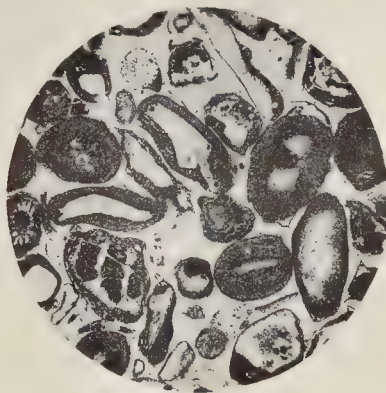


Fig. 8 SHELLY OOLITIC LIMESTONE  
Bath Stone, Winsley ground

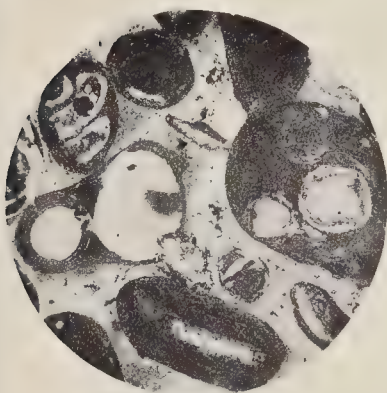


Fig. 9.—COARSE SHELLY-OOLITIC LIMESTONE  
Bath Stone (Westwood ground)

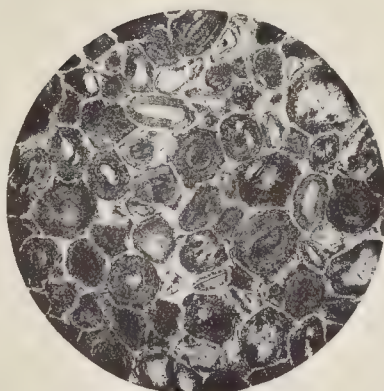


Fig. 10.—OOLITIC LIMESTONE  
Bath Stone, Kingsdown

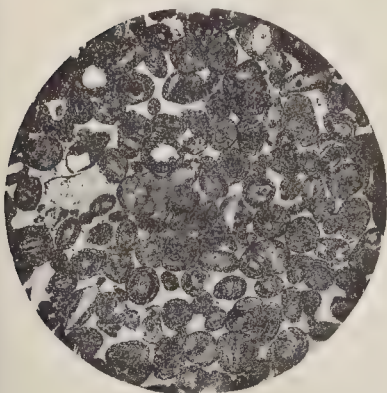


Fig. 11.—FINE OOLITIC LIMESTONE  
Portland Stone (Tout quarry)

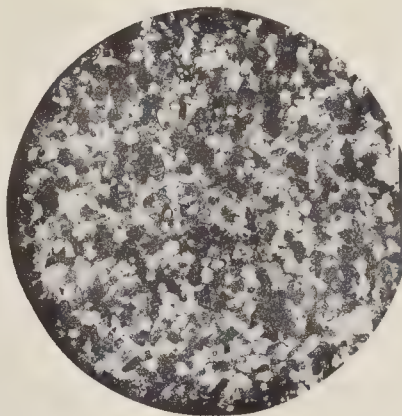


Fig. 12 SANDSTONE  
Corsehill, Annan, Dumfries









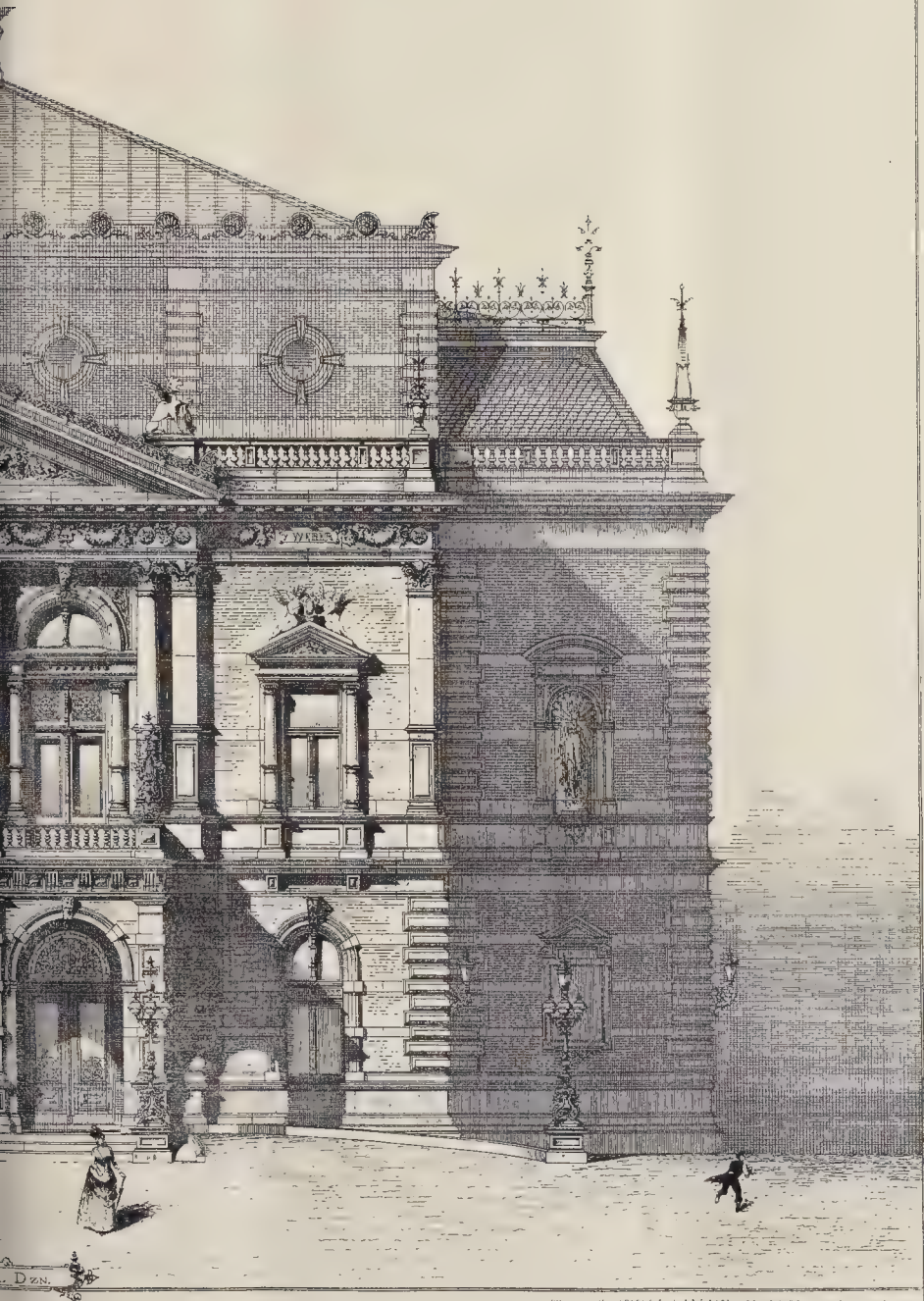
NEW THEATRE. ROTTERDAM.

ENTRANCE ELEVATION.



HERR J. VERHEUL. ARCHITECT.

Scale of Metres







plans we illustrate of the *entresol* and the level practically explain themselves, but are not reproducing one at ground level, it will be well to supplement the former with remarks on the main entrance. There is a large approach to the front from which the vestibule *A* can be reached by passing three double swing doors and ascending a few steps. This vestibule can also be reached by foot-ways coming up from either side. These, however, have to first pass the small outer lobbies (*B*) to the right and left. There are four offices (*a a*) in the vestibule, two each for the managers of the German Opera and the Dutch each administration having a separate day office and a ticket office for the hour prior to performance. These are not the only ticket offices, as there are two for the lobbies of the boxes to the third and fourth tier respectively. The reserved "pit" having been arranged for, offices in the main vestibule only have to be tickets for the different classes of stalls and first and second tiers. No part of the program can be entered on the vestibule level, fifteen steps having to be mounted to reach the stalls or *entresol* floor.

referring to the last-named plan, it will be that the stalls with the lowest row of boxes have their own staircase on either side of road passage which runs round the auditorium, and have no direct communication, as one almost expect, with the grand staircase coming from the vestibule to the first tier and its stairs. This, it is true, keeps the separate entrances of the audience well apart in case of an exit, but we do not think there would be much extra risk, if the lower floor had one of the four staircases. The number of stalls in the first tier is comparatively small, there are some 460 on the stalls level, will first strike an Englishman is that the should be so high above street level. This course, due to there being no possibility to the stage cellars well below the street level, being at a great expense. As will be seen in the section, the building had to be put on

referring to the first tier plan, we may call attention to the extensive *foyers* which have been provided for the use of the part of the audience in the stalls. The communication between the stalls and the first tier is by way of a continuation of the two stalls staircases mentioned above. What with the spacious *foyers* the playgoer will, indeed, have sufficient for an *entr'acte* stroll. In front of the stalls there is also a roomy balcony which can be used for the summer.

plans of the other tiers practically repeat themselves, and even the gallery has been provided with a large *foyer*. As in the case of the first tier, this room is provided with seats for light refreshment.

The seating capacity of the building is not very large, the total being 1,257. The floor of the stalls, together with its boxes, has 468 seats, the tier 225, the second 104, and the third 400, average width of the seats is 56 centimetres, in.

to the "back of the house" we would only say that all the main structural parts of the stage scenery and fittings are of iron. The stage measures 18 by 25 metres, or 59 ft. by 82 ft., as a proscenium opening of about 11 metres, 11 ft. square. The latter is protected by a curtain which can be closed in 45 seconds.

The building is heated throughout by hot water. The illuminant is gas, for which there are more than sixteen hundred burners. There are more than thirty hydrants in the building, and eighty emergency oil lamps have been provided in the passages, staircases, &c.

Elevations are in brick and free stone, in the Renaissance (or what is called so by many) being the style adopted. Mr. Marqui, it seems, is to some extent responsible for the decoration, and Herr Rosenberg, the architect at the Cologne City Theatre, designed the machinery. We understand that M. J. Al has, since the completion of the Rotterdam Theatre, prepared the designs for the new theatre at The Hague.

## MICROSCOPIC STRUCTURE OF ROCKS.

These reproductions from sections of stone as seen under the microscope are introduced as illustrations to the Student's Column of this week (page 220), and are referred to and explained

## COMPETITIONS.

**CONGREGATIONAL CHURCH AND SCHOOLS, NORTHAMPTON.**—The competition for the new Congregational Church and Schools, Kingsthorpe-road, Northampton, has resulted in the plans of Messrs. Mosley & Anderson, of Northampton, being adopted.

**WORKHOUSE QUESTION, STOCKPORT UNION.**—On the 12th inst., at a meeting of the Board of Guardians of the Stockport Union, the Chairman, Mr. C. Earnshaw, presiding, the question of workhouse extension was considered. Mr. J. Williamson proposed that the selected competitive plans, on which the Board had paid a premium of 300*l.*, be sent to the Local Government Board for approval or otherwise, and that the architect to the Local Government Board be asked to come down and advise the guardians. These plans would involve spending 40,000*l.* on the site of the present workhouse at Shaw Heath. A strong feeling prevailed, he said, that it would be better to build an entirely new workhouse on another site. Mr. J. Rowcroft urged that the plans to which the second premium of 100*l.* was awarded be also sent, inasmuch as the cost of carrying these into effect was estimated at 10,000*l.* less. After voting on several amendments, the Board instructed the Clerk to send to the Local Government Board for approval or otherwise the first and second sets of the competitive plans.

**BATH PUMP-ROOM EXTENSION.**—The Baths Committee have at length, says the *Bath Chronicle*, made a step forward in regard to the Pump-room Extension Scheme, and there is some prospect of the work being taken in hand. At all events the Committee have met Mr. Brydon, the architect, in consultation with Mr. Waterhouse, and Mr. Brydon has received instructions to prepare and submit to the Committee a sketch plan on lines less pretentious than those followed in the competition. Special attention will of course be given to the covering of the great Roman Bath, and one feature of the design will in all probability be a balcony all round it, but preserving untouched the piers and other remains of its ancient grandeur. The elevation of the building in the churchyard will be only one story, the Concert-room will not be the prominent feature it was in the original plan, and the other accommodation will not be so extensive as was at first proposed.

## ARCHITECTURAL SOCIETIES.

**CARLISLE ARCHITECTURAL, ENGINEERING, AND SURVEYING ASSOCIATION.**—At a meeting of this Association, held on the 7th inst. in the Town Hall, Mr. C. W. Hill, sanitary inspector, delivered a lecture on "The Sins of the Jerry Builder and their effects on the Public Health." Mr. C. Lonsdale presided. Mr. Hill commenced by defining the meaning of "jerry builder," and where and how he flourishes, and said his victim is, as a rule, the working man who has saved enough money to buy a house of his own, and is led to believe that he is making a bargain by purchasing his dwelling from such a builder for a few pounds less than a proper house could really be built for. The lecturer pointed out many of the devices practised by the "jerry builder" to economise in the erection of a house, notably those of bad foundations, hollow walls, filled in with earth or rubbish, hollow chimney-breasts, causing smoky chimneys, no flashings to roof, wall plaster made of street sweepings, &c., floors laid on the bare earth, and defective house drains, in which the ingenuity of the unscrupulous builder is seen to such advantage by the use of bad pipes and cheap fittings, &c. He spoke very plainly on the importance of efficient house drainage and plumbing to prevent the escape of sewer gas, so conducive to the contraction of typhoid fever and diphtheria, and said he was of opinion that not 10 per cent. of the drains laid up to ten years ago in Carlisle would now stand a proper test. The lecture was illustrated by a large number of coloured drawings, some of them showing a remarkable state of defective drainage, and the lecturer pointed out the necessity of a rigid and constant supervision by a public inspector of all buildings while in course of erection. A hearty vote of thanks was accorded Mr. Hill at the conclusion of his lecture.

**ARCHITECTURAL SECTION OF THE GLASGOW PHILOSOPHICAL SOCIETY.**—Mr. P. Macgregor Chalmers, F.S.A., Scot., lectured on "The Development of Architecture as Exhibited in Scottish Abbeys and Cathedrals" to the Architectural Section of the Glasgow Philosophical Society on the 5th inst. The subject, he said,

was one he had studied for a quarter of a century, and the only reliable guide was the art itself, as dependence on local tradition, carvings, charters, coats of arms and such like, led to error. This had been shown in the case of Glasgow Cathedral, where the central tower was recorded to have been built by Bishop Robert Wishart, the truth being that it was the north-western tower for which he was responsible. In the same structure a coat of arms had led antiquarians to ascribe the lower story of the south transept to Archbishop Blackadder, whereas it was in reality the work of the thirteenth century. Lime-light views were shown illustrating the progress of the art from the church of St. Regulus at St. Andrews in the middle of the eleventh century to the sixteenth century, when Gothic art gave place to the Renaissance.

**GLASGOW ARCHITECTURAL ASSOCIATION.**—The annual business meeting of this Association was held in the rooms, 114, West Campbell-street, on the 6th inst. The reports submitted by the Committee and the Treasurer were read, and showed the Association to be in a satisfactory condition, both as regards membership and financial affairs. The reports being approved, the office-bearers for the coming session were elected. They are as follows:—Hon. President, Mr. William Leiper, A.R.S.A.; President, Mr. A. N. Paterson; Vice-President, Mr. W. Tait Conner; Hon. Secretaries, Mr. John White and Mr. Walter R. Watson; Hon. Treasurer, Mr. William Fraser; Hon. Librarian, Mr. Alexander McGibbon; Committee, Mr. Hugh Dale, Mr. Robert J. Gildard, Mr. J. E. Potts, and Mr. Andrew Robertson.

**EDINBURGH ARCHITECTURAL ASSOCIATION.**—On the 7th inst., at a meeting of the Edinburgh Architectural Association in the Royal Institution, the President, Mr. W. W. Robertson, referred to the death of two members—Mr. A. Heiton, Perth, and Mr. Simpson, Leith, and it was agreed to record the Association's deep regret at the decease of these gentlemen. The Chairman also referred to their deputations to the Town Council on the subject of the proposed New North Bridge, and to the points which had been laid before the Corporation. Mr. Thomas A. Croll, F.S.A. (Scot.), then read a paper entitled "The Man in the Street—a Non-Professional View of Architecture." The lecturer passed in review various features in architecture as they impressed an unlearned person. The laborious plan of building up streets on cellars whose object was to create underground apartments, once so largely in use in Edinburgh, was noticed with its application to public buildings. Mr. Ruskin's remarks on a building in Edinburgh were quoted in a criticism of inappropriate detail, and certain churches stopped in their design by foundation reasons were referred to. The emblem of eternity on the façade of the slaughterhouse was mentioned as a curious solecism.

The interior of a house was next dealt with, and this question was asked, why all rooms should be mere rectangular boxes, a house near the place of meeting being described with round, oval, and recessed rooms. Proceeding to treat of entrances and exits, the faultiness in this respect of a number of public places in Edinburgh were next referred to, and the last subject treated was that of bridges, the North Bridge question being taken up, and the hope expressed that the new bridge would not be placed in the hands of an engineer, as when it was widened in its first form it had at least fine proportions, but it was difficult to understand what was the mental condition of the Town Council who approved of the alteration of twenty years ago. The speaker then asked if the members were prepared to submit to the half-century-old gibe of the Camden Society, that "if we must be utilitarian we shall never be good architects." He was persuaded the Association would not, and that, if only the opportunity were afforded, there would be found architects who could so apply old principles to new needs, that a bridge, at once strong and stately, graceful and artistic—and perhaps economical—would be provided to displace the ugliness of to-day, and to adorn the grand site the bridge occupied. At the close a hearty vote of thanks was accorded to Mr. Croll for his paper.

**GLASGOW SCHOOL OF ART.**—The course of lectures by Mr. William J. Anderson on the Architecture of the Renaissance in Italy was brought to a close on the 7th inst., when it was intimated that a similar series by Mr. Alex. McGibbon, on "Gothic Architecture," was arranged for next winter, as well as another course dealing with advanced problems of building construction. In briefly reviewing the session's work in introduction, the lecturer stated that the



Italian revival, like other revivals in Art and Architecture, took rise in bold and original work inspired by the prototype, but mixed with a good deal of what was current, and thereafter ran a course of closer approximation to that pre-existing type till something like literal reproduction was reached, rules prescribed, and the revival finally robbed of its vitality. Another characteristic tendency also observable in such a movement as the English Gothic revival was that the latest periods of the old work were first seized upon by the revivalists, who thereafter inclined more and more to adopt earlier treatments. Thus the Italian Renaissance architecture, originating in the work of Brunelleschi and others who were inspired by a study of late antique Roman, gradually inclined to imitation of the style of Augustus' time and ended in the almost Grecian work of Palladio. "Palladian Architecture and the Decline" formed the special subject of the concluding lecture, the chief part of which was devoted to an analysis and criticism of nearly all Palladio's works at Vicenza and Venice which were fully illustrated by lantern views and diagrams. Although in England his name had attained a fictitious importance relatively to several earlier masters and his talents were buried in inferior material, generally his work showed good taste, a fine sense of proportion, and no little originality in composition. The works of his contemporary Vignola were shown in comparison, as well as those of other architects of the later period in Rome, Genoa, and Venice, the most active centres of the time. The causes of decadence were manifold, but at least two tendencies of the kind are clearly distinguishable in the work itself. First, that of the purists, such as Vignola, Palladio, and Serlio, bound a little too firmly to ancient usages and the measurements of Vitruvius, the results being the coldness and formality that was common to their work and teaching. Coeval with this, but outlasting it, and of wider and more disastrous influence, was the tendency due, in the first instance, to Michelangelo. In the hands of his imitators the traditional use of architectural features and detail was misunderstood or purposely misapplied, and uncontrolled freedom was indulged in these without regard to their proper application.

**NORTHERN ARCHITECTURAL ASSOCIATION.**—The annual selection of drawings in connexion with this Association, including those which have gained prizes in connexion with the Royal Institute of British Architects, were placed on view in the art section of the Art Gallery, Newcastle, on the 13th inst.

**SHEFFIELD SOCIETY OF ARCHITECTS AND SURVEYORS.**—The ordinary meeting of this Society was held at the School of Art on the 13th inst., Mr. C. M. Gibbs presiding. After announcing, in touching terms, the sudden decease of their late Vice-President, he moved the following resolution, which was seconded by Mr. F. Fowler, and passed in silence, the members expressing approval by rising from their seats:—"That the President, Council, and members of the Sheffield Society of Architects and Surveyors desire to express their sincere sympathy with Mrs. Mitchell-Withers, Mr. J. B. Mitchell-Withers, and the family, in the sore bereavement they have sustained by the death of the late J. B. Mitchell-Withers, F.R.I.B.A., F.S.I., whose relations to members of the profession generally were always so kindly as to have not infrequently ripened into personal friendships. His able and honourable practice commanded the respect alike of the public and of the profession, and maintained its highest traditions; his devoted and successful performance of public duties reflected credit on his profession; and his services in the formation of the Society and in its management as a member of the Council, and as Treasurer and Vice-President with his lectures, are recorded and most gratefully remembered, and the Society desire to express their deep sense of the great loss they have sustained."

#### ARCHÆOLOGICAL SOCIETIES.

**BRITISH ARCHÆOLOGICAL ASSOCIATION.**—On the 7th inst. a meeting of this Association was held, Mr. Allan Wyon, F.S.A., in the chair. Mr. Earle Way described some remarkable finds which have recently been made at Southwark, near the site of the old Marshalsea Prison. On a former occasion, the discovery of a great many piles on what was once marshy ground had been reported. More recently, a great many flint implements of the neolithic period have been found, with evidences of manufacture on the spot, these being in a thin bed of sand below the later

accumulated soil. Mr. Loftus Brock, F.S.A., spoke of the evidences, brought to light at various times in past years, of the discovery of piles, as if associated with lake dwellings, in various parts of Southwark. Mr. de Gray Birch, F.S.A., exhibited a squeeze from a Roman altar at Schloss Furstenau, Hesse Darmstadt, dedicated to Diana, by Vitales. The Rev. J. Cane-Browne exhibited a silver Royalist badge, cast and partially engraved, which had been preserved by his family for several generations. A paper was then read by the chairman on some additions to what is known relative to some of the great seals of England, and photographs of several examples were exhibited. It was shown that, although Edward III. renounced for a time the title of King of France, nevertheless, the fleurs de lys of France still appeared on the great seal. By inspection of a deed in the Augmentation Office, the engraving of Queen Elizabeth's second seal, used in 1587, is proved to be the work of Nic. Hilliard, and he was granted a lease of certain property for twenty-one years in consideration of his having done so. Some curious particulars were rendered with respect to the want of a great seal by Parliament, during the Civil Wars, when the great seal of England was with the King. Charles II., when in considerable monetary difficulties, ordered the making of seals, and some unpublished documents were referred to. The existence of a hitherto unknown fourth seal of Charles II. was proved, there being minute roses in the field. It is used on and after 1673, but there seems to be no existing record why the previous seal was discarded for the insertion of the roses. A second paper on Repton Church could not be read owing to the lateness of the hour.

### Correspondence.

To the Editor of THE BUILDER.

#### ELECTION OF FELLOWS, ROYAL INSTITUTE OF BRITISH ARCHITECTS.

SIR,—I feel indignant at the result of the voting for the election of Fellows, i.e., the rejection of candidates, brought about by a clique of members, who have inflicted a cruel wrong upon six professional men recommended for election by the Council. Personally, I can testify to the trouble the Council took to satisfy themselves as to qualification for candidature.

Presuming that there were one or two candidates who were distasteful to the clique, is the wholesale rejection of approved candidates justifiable simply because they were not Associates? If this qualification is to be the *sine qua non*, let the Council so inform intending candidates and prevent disappointment and waste of time. The nine has been sprung, in my opinion, in a cowardly manner. The by-laws do not provide that candidates for the Fellowship should necessarily be Associates. The result of the proceedings has, in my opinion, damaged the prestige of the Institute and its Council.

THOMAS BATTERBURY,  
Fellow (elect) R.I.B.A.

March 14, 1890.

### The Student's Column.

#### THE STRUCTURE AND PHYSICAL PROPERTIES OF BUILDING STONES.—XI.

##### MICRO-STRUCTURE OF ROCK-FORMING MINERALS (continued).

**A**N abundant mineral, entering into the structure of many building stones is

*Mica*.—Of this there are several varieties, but we need only mention two—biotite and muscovite. Biotite is usually black, or dark bronze-coloured; under the polariser it mostly exhibits a brown tint with a number of dark, parallel lines running across. Its outline is generally very irregular; and the mineral is strongly pleochroic.\* Muscovite mica, on the other hand, is of a silvery, or light bronze tint; under the microscope, when viewed at right angles to the basal plane, it shows tolerably strong chromatic polarisation, in this respect differing from biotite, which, under similar conditions becomes dark between crossed Nicols. An essential constituent of granite and other igneous rocks; found also in many flagstones, the

fissility of which is due to the arrangement of mica along certain planes.

*Hornblende*.—This mineral, although also in syenite and other rocks used as road-metal of sufficient importance in our present to warrant us in describing its micro-character in any detail. Under the polariser it presents distinct lines of cleavage disposed in manner as to produce a lattice-work appearance. It is markedly pleochroic, which, among things, serves to distinguish it from

*Augite*, which is found in rocks of volcanic character. This is only feebly pleochroic, and is remarkable for the inclusion of minute crystals of other minerals within it.

*Olivine*.—This mineral is a common constituent of many basic igneous rocks used in road-metal and also of some foreign polished ornamental stones in the English market. It is usually olive-green tint, and under the microscope polarised light gives bright colours, especially green. It does not exhibit pleochroism generally traversed by fine fissures, and liable to become altered into—

*Serpentine*.—Although it is not certain that large masses of serpentine at the Lizard elsewhere in this country were originally yet the change from the latter to the former be traced through every possible gradation. Geikie remarks that "there can be little that it is, in most cases at least, a product of alteration of pre-existing minerals, and especially of olivine." Under the microscope it is green, and through its base runs a network of dark opaque threads and veinings. Polished it produces a handsome marble.

*Schorl*.—Occurs chiefly as long, black, like prisms. Under the microscope it is pleochroic, but may be distinguished from blende and biotite by the absence of well-defined lines of cleavage. Common in many gneisses, especially from Cornwall.

*Magnetite*.—This is a form of iron-ferrous oxide, and is markedly magnetic. Under the microscope it is so intensely opaque that its structure can usually be made out; in reflected light it has a bluish black tint. Common in many igneous building stones.

*Iron Pyrites* has a brassy lustre, from circumstance it may be readily distinguished from magnetite. Like the latter, it is opaque sections. Common in the best-known building stones, and in many slates, as cubical crystals.

*Calcite*.—A crystalline form of carbonate of lime. Under the microscope clear crystals are readily distinguishable by their intersecting cleavage lines and twinning. It is strongly refractive, a property which may be observed using the analyser alone; it polarises in blue, and grey tints. An exceedingly common constituent of many building stones and marbles.

*Aragonite*.—Another crystalline form of carbonate of lime, which can only with difficulty be distinguished from calcite by aid of the microscope, under which it shows biaxial polarisation in convergent light. It is also very common in building stones.

Of all the common rock-forming minerals mentioned in this and in the preceding articles, none are as important in the micro-examination of limestones and sandstones as quartz, and aragonite. The first-mentioned forms the base of nearly all sandstones used in building, whilst the two last-mentioned enter very largely into the formation of oolites and other limestones. But there is a great difference in the weathering properties between quartz and the other two minerals. Quartz is practically indestructible, even in the open air, and nearly always exhibits a fresh appearance, whether in sandstones; and the weathering properties of the stones containing it essentially, are dependent on its mode of occurrence—whether as grains of sand, or as binding together the constituent parts of the material. Calcite and aragonite are both much more unstable minerals and exist in building stones in various states of decomposition. On their actual state of preservation of the stone almost entirely depends. In hard crystalline limestone puts on its freshest appearance, and is the most durable in that form than in any other; it may trace every gradation, from the crystalline such an earthy condition that it ceases to be calcite, and becomes more earthy carbonate of lime. So, also, with aragonite.

The student is particularly requested to note that practically every oolite or other limestone used by the architect, contains either calcite, or both, together with a certain amount of earthy carbonate of lime. It has been shown that when the oolitic granules or fragments

\* See the last article in this series (p. 204) for a definition of this term.



shelly matter in a limestone are cemented either by crystalline carbonate of lime, that stone will prove more durable in a building than one in which the granules and fragments distributed in a matrix of less crystalline, or of their carbonate of lime. Now this is not true, at least, is very much at variance with the facts, and requires considerable modification. In fact, from a careful microscopic examination several hundreds of building stones, that the granules and fragments are either (1) held together by crystalline calcite (or aragonite, as the case may be), or partially so; or (2) the constituent fragments are merely cemented together at their points of contact with each other, and there is no matrix properly so called; or (3) spaces exist between the fragments which have to make up the stone. In face of this, it would naturally feel inclined to regard the stone with the crystalline matrix as more durable than one with practically no matrix whatever. But the reverse is actually the case, and we go so far as to state that the best limestones in the market—Portland, of the Isle of Portland, for example—have little or no matrix, the region between the granules and fragments being quite void. The cause of this will appear in the sequel.

#### GENERAL MICRO-STRUCTURE OF BUILDING STONES.

Having glanced at the micro-structure of those rock-forming minerals, we are now in a position to explain the manner in which they are used in rocks. For this purpose we will select a number of divers kinds of building stones, and briefly describe their appearance under the microscope. To assist us in this matter we give illustrations of twelve well-known building stones as a double plate in this issue. These illustrations are taken from micro-photographs, and represent the appearance of sections of the stones under the microscope, in transmitted light. An example being magnified to the same extent ( $\times 50$ ), they are all strictly comparable to one another.

**Fig. 1.—Granite.**—From Carnsew quarry, Penryn, Cornwall. In this the three principal minerals of granite are seen. The clear felspar is slightly dotted over here and there with mica; the striated dark crystal in the centre of the illustration is mica, with its characteristic radiated edges; whilst the felspar may be seen in the shaded parts, with no regular structure in evidence. It is particularly desirable to note that none of these minerals are bound together by cementing material; they are all interlocked with one another and the rock is crystalline throughout.

**Fig. 2.—Slaty Marble.**—From Carrara, Italy. The whole of the stone is made of small crystals of calcite closely packed together and welded to each other. Some of them show the characteristic twinning, or parallel cleavage lines. The dark, irregularly-defined band running across the section is a small blue vein, probably carbonate of iron.

**Fig. 3.—Shelly Limestone.**—From Hamling Quarry, near Yeovil, Somerset. Made of fragments of shelly matter, bound together by crystalline granular calcite. The shells may be seen as longitudinal sections and in pieces having striated structure; the granular calcite is the binding substance between these, but the stone is of free, open spaces, denoted by long light patches. The durability of such a stone depends entirely on the state of crystallisation of the calcite referred to. This structure is extremely characteristic.

**Fig. 4.—Fragmental Limestone.**—From Doulting Quarries (Chelnych bed), near Shepton Mallet, Somerset. Made of fragments of crinoid stems, pieces of shell, &c., bound together by calcite, the whole being so much held by secondary agents that the edges of the fragments are practically fused with the matrix. The calcite of the latter shows the characteristic twinning very clearly, and is not peculiar. The crinoid stems may be easily recognised by the perforation in or about their centres, and by the arrangement of the regular rings, or dots. The weathering properties of such a material as this are largely controlled by the relative porosity of the lines of junction of the shells with one another, and especially by the nature of their cleavage planes.

**Fig. 5.—Organically-formed Hard Limestone.**—From the Carboniferous formation of Walsfield, Glos. This mineral, which is much more crystalline, or harder, and more compact than that represented in fig. 4, is made of minute fragments of crinoid stems and plates, shelly

matter and other organic remains. The whole is firmly bound together and indurated by calcite of the most durable description. Such material readily takes a polish, and if present in sufficiently large blocks in the quarry can be cut into marble; it is generally too hard for free working, and is used for road-metal and paving sets.

**Fig. 6.—Shelly Limestone.**—From Westwood quarry (paving bed), near Bradford-on-Avon. Composed of fragments of crinoids, long strips of shell, &c., in a matrix of calcite. The large four-sided piece in the centre of the illustration is a characteristic crinoid section. We may mention that this is one of the Bath stones, and that, prior to our investigations, had been thought to be an oolite.

**Fig. 7.—Organic-Fragmental Limestone.**—From Doulting quarries (Brambleditch bed), near Shepton Mallet, Somerset. Made of a heterogeneous assemblage of organic remains, and adventitious particles bound together by rather earthy calcite, and having many free spaces.

**Fig. 8.—Shelly Oolite.**—Bath stone, from Winsley quarries, known as "Winsley Ground" stone. Composed of well-formed oolitic granules, shell fragments, mostly surrounded by oolitic structure, corals, &c.; the whole bound together by granular calcite with cleavage planes not very apparent. It will be noticed that in addition to the matrix, properly so-called, lending support to the stone, that the majority of the fragments are joined to each other. The durability of such a stone as this depends on the state of the granular matrix.

**Fig. 9.—Coarse Shelly Oolite.**—Bath stone, from Westwood quarries, known as "Westwood Ground" stone. Made of large, abnormal oolitic granules, having several granules bound in one, with a fine calcite matrix. The weathering would be controlled by the state of the oolitic granules, the matrix being well formed.

**Fig. 10.—Oolite.**—Bath stone, Kingsdown quarry. Composed of well-formed oolitic granules, not adhering to each other, but having a film of calcite, slightly decomposed between, which binds the whole together. The student can observe true oolitic structure to perfection in this material. The weathering of the stone is dependent on the state of the granules, but mostly on the rather earthy matrix.

**Fig. 11.—Fine-grained Oolite.**—Portland stone, from Tout quarry, Isle of Portland. Made of minute oolitic granules of a crystalline nature, the structure of which has been materially modified by secondary alteration. The granules adhere to one another, and in some cases appear to interlock. The student is particularly requested to note that this stone has no matrix whatever, but that the weathering of the material is entirely dependent on the adhesion of the particles to each other. This structure is exceedingly characteristic of Portland stone.

**Fig. 12.—Sandstone.**—From Corsehill, Annan, Dumfries. Made of sand, partially bound together by iron, which imparts the characteristic red colour to the material. The sand is largely quartzose, but fragments of felspar, &c., here and there occur, whilst in places the matrix (which is very minute in quantity) is filled with granular quartz. The darker portions are not so dark in reality; they are produced by the red film covering certain of the quartz grains, which, by the photographic process, comes out black.

#### OBITUARY.

MR. R. C. REID, C.E.—The death has just occurred, at the age of forty-eight, of Mr. R. C. Reid, C.E., Edinburgh. He was a member of the firm of J. & A. Leslie & Reid.

#### GENERAL BUILDING NEWS.

ADMIRALTY WORKS, APPLEDORPE. The tender of Mr. W. Dart, builder, Crediton, has been accepted by the Lords Commissioners of the Admiralty for the erection of timber-framed two-gun firing-battery drill shed, brick magazine, &c., at West Appledore, Devon. The walls of the battery are of English-oak framings, 12 in. thick, with deals and roof of Danish fir and pitch-pine. The work is to be commenced immediately, and completed in eight months.

WESLEYAN CHAPEL AT FISHPONDS, GLOUCESTERSHIRE.—On the 28th ult., a new Wesleyan Chapel and Schools were reopened at Fishponds. The architect was Mr. William Paul, of Bristol. The chapel itself has been built to seat 450 persons. Adjoining the chapel are a minister's vestry, ladies' vestry for sewing meetings, &c., a general vestry, and also lavatories and other offices. Then there is a school-room with class-rooms to accommodate 500 children, and also another vestry.

TEPID BATHS, IPSWICH.—The tepid baths in St. Clement's, Ipswich, were opened on the 1st inst. by the Mayor, Mr. S. R. Anness. The front of the building, with the exception of a projecting portico, is built with white Ancaster stone. On entering the vestibule on the right hand is the attendant's office, where tickets will be given. Twelve slipper-baths, six on either side of the vestibule, also open into it. The swimming-bath measures 70 ft. by 22 ft. At the shallowest end, that nearest the entrance, there will be 4 ft. of water, while at the lower end the depth will be about 7 ft. 50,000 gallons of water are required to fill the bath. Its walls are of concrete and white glazed brick. Several feet from the edge of the bath round the building are built thirty-three dressing-boxes. The space between the bath and the boxes, and also the floor of the bath, is laid with mosaic paving, by Messrs. Diespeker & Co., Holborn Viaduct. A gallery runs round the entire building over the boxes for the convenience of the public, of whom about 400 can be accommodated at entertainments. The gallery is supported by timber pillars on stone bases. The bath is lighted by a skylight or lantern, 70 ft. in length. Above the boiler-room, which is situated behind the baths, in the basement, are various rooms fitted up for the laundry work of the establishment, such as washing, drying, and mangling. The architect was Mr. T. W. Cotman, and the builders were Messrs. T. Parking ton & Son.

NEW BUILDINGS, WOODVILLE, NEAR BURTON-ON-TRENT.—An extensive range of buildings at Woodville, for pottery-ware purposes, for Messrs. Outram & Co., which were contracted for by Mr. John Narlow, of Burton, consisting of slip houses, workshops, greenhouses, clacing shops, hovels, and warehouses, are just completed. These buildings have also been fitted up by Messrs. Boulton & Co., of Burslem, and Messrs. Buxton & Thornley, of Burton, with all the newest plant and machinery, theovens being built by specialists. The architect was Mr. R. E. Carpenter, of Burton.

CONSERVATIVE CLUB, ABERDEEN.—The Aberdeen New Constitutional Club was formally opened on the 8th inst. The club, which is situated at the junction of Canon-street with High-street, has been built by Mr. Lissaman from the designs of Mr. T. C. Wakeling, of Merthyr, the cost of the building and furnishing being about 5,000l. The premises were erected by the Aberdeen Constitutional Club Building Company. On the ground floor there is a large hall with a balcony which is available for general entertainments, the whole being capable of seating 700 people. There is also a bar, a smoking-room, and a dining-room, with cellars underneath. Upstairs there is a billiard-room fitted with two tables, together with a reading-room, a card-room, a library, a committee room, and bath-room with lavatory, the upper portion consisting of rooms for the use of the manager and managers.

CHURCH, TURNER'S HILL, SUSSEX.—The foundation-stone has just been laid of the church which is to serve for the new Ecclesiastical parish to be formed out of the ancient parishes of Worth, Ardingly, West Hoathly, and East Grinstead, and from the new parish of Crawley Down, Sussex. The work is being carried out under the supervision of the Diocesan architect, Mr. Lacy W. Ridge, and will be Gothic in design. The whole plan will not be at once carried out, but the nave and aisle, which are in the parts at present in course of erection, are to cost 2,300l. The material used externally is Bath and local stone. The contractors are Messrs. James Longley & Co.

WYCLIFFE NEW CONGREGATIONAL CHURCH, TOTTERDOWN.—The new Wycliffe Congregational Church building which has been erected at Totterdown, was opened on the 8th inst. The contract has been carried out by Mr. John Perkins, and the heating apparatus by Messrs. Skinner, Board & Co. The architect is Mr. J. H. La Trobe, of Bristol. We gave some particulars of the new building in our issue for July 22, 1893, page 72.

WORKMEN'S HALL, BLAENGARW, GLAMORGAN.—A workmen's hall has just been erected at Blaengarw. The building consists of a hall 56 ft. long by 36 ft. wide, with a stage and two small ante-rooms at one end, and a gallery round three sides, and altogether providing sitting accommodation for 600 people. In the wing to be devoted to the purposes of the library is a reading-room 40 ft. by 24 ft., a room for the circulating library 14 ft. by 20 ft., and a committee-room 24 ft. by 14 ft. for the workmen. Underneath the library is accommodation for the caretaker, and beneath the hall are large rooms. The contract for the undertaking is 3,099l., and Messrs. C. Jenkins & Son, of Bridgend, are the contractors. The architect was Mr. J. Rees, of Penarth.

WESLEYAN CHAPEL, NEWBRIDGE, CORNWALL.—A new Wesleyan chapel has just been built at Newbridge. The new chapel provides accommodation for about 200 persons. It is some 60 ft. long by 22 ft. in width. At the rear is a class-room, which will also be used as a ladies' work-room for bazaars, and as a senior class-room. The usual out-offices, &c., are in the rear, and are entirely apart from the chapel. The seats are of pitch-pine, and varnished. The communion is of the same wood to match the seats. The style of architecture is Norman. At the main gable end is a three-light stained-glass window. The entrances are



on the eastern side, and the doors correspond with the other portions of the building. The chapel is further lighted by six circular-headed windows, each one being 12 ft. high by 4 ft. in width. A portion of the mason's work was carried out by Mr. R. Marks, and another portion by Messrs. Pidwell & Rowe, of Penzance. Mr. Francis Gibson, of St. Just, did the carpentry work. The whole of the work has been carried out under the superintendence of Mr. J. W. Trounson, architect, of Penzance.

**CHANCEL, ST. PAUL'S CHURCH, BRISTOL.**—On the 6th inst. the consecration took place of the new and extended chancel at St. Paul's Church, Portland-square, Bristol. The works which for some months past have been in progress at the church, forming the first portion of the general improvement scheme, consist of a lengthened chancel in a rectangular form, and increased height, and of a vestry on the south side to receive the organ from the west gallery. The east wall of the sacristy contains a large five-light traceried window filled with figure subjects, the principal one being that of St. Paul preaching at Athens. Beneath this window is a recess of Bath stone, and the floor of the chancel, centre, and panels on either side containing wheat and the vine. In the south wall are three sedillas, on the north side being an arched and moulded recess in which is placed the Vassall monument. The walls inside and out are of Bath stone ashlar, and the ceiling of the sacristy is boarded and divided into panels. The choir stalls are of oak, the pulpit of Bath stone, and the floor of the chancel and sacristy are laid with encaustic tiles. The general contractor for the work is Mr. George Henry Wilkins. The stone carving has been executed by Mr. Smith, the wood carving by Mr. Wilmot, and the glazing by Mr. Moon. The brass communion rail and standards are the work of Messrs. Singer & Sons, of Frome, who have also supplied the lectern as well as the metal work of the pulpit. The removal and re-erection of the organ was entrusted to Mr. Johnstone. The architect is Mr. John Bevan, of Bristol.

**GIRLS' INDUSTRIAL SCHOOL, DUNDEE.**—A new girls' industrial school is to be erected in Dundee on the lands of Balgay, on the north side of Blackness-road and south of the Balgay Hill. The administration department has been confined to the front elevation, the dining-room, kitchen, and offices occupying the east portion, and the school-room and sewing-room the west. The dining-room and school-room will be each 60 ft. long by 23 ft. broad. Advantage has been taken of the fall in the site to obtain a basement story under the scullery wing, to be utilised for a milk pantry and stores. A large store is provided in the west side of the centre block, and the corresponding room on the east side provides for the matron's store. The drill-room and play-room are placed at the north-west corner, the former being fitted with fixed gymnastic apparatus. The washing-house, laundry, and coalhouse fill up the remaining portion of the quadrangle. The receiving-room and room for children seeing their parents is placed at the north-east corner. It is cut off from the square, and has its own entrance in sight of those about the kitchen. Entrance to the sick-room will be from the quadrangle, and a door will be provided to the passage for removing infectious cases. A paved verandah gives access to all departments entering off the square. On the first floor two dormitories, with the necessary accommodation for attendants, and each containing twenty-three beds, will be provided on the east and west sides. In the front there will be dormitories for thirteen and six beds respectively, the latter being intended for delicate children, or those having ailments not infectious. The lavatory for younger children is to be fitted with a large bath in the centre, and the east lavatory will have three plunge baths. A clothing store will adjoin each of these lavatories. In the upper part of the staircase a delinquent's room will be provided, and on the third floor, which extends over the centre block, there are three separate girls' rooms intended for those shortly to leave the institution, and to give them a certain responsibility in keeping their own room. The site, which extends to three acres, is situated at an elevation of 220 ft. above the sea level, and will be enclosed eventually by a stone wall. The elevation shows the treatment of Scottish architecture adapted to the domestic character of the institution. Accommodation will be provided in the building for 115 girls, and the cost of its erection will amount to about 10,000l. Messrs. James MacLaren & Sons, Dundee, are the architects.

**ADDITIONS TO MESSRS. McDOWALL, STEVEN, & CO.'S PREMISES, UPPER THAMES STREET.**—As we briefly mentioned last week Messrs. Steven Brothers, & Co., architectural ironfounders, have registered their firm as a limited company, under the title of McDowall, Steven, & Co., Limited. The same firm has just carried out various alterations and additions to their warehouse and show-rooms in Upper Thames-street, the whole of the area of the premises of five floors, extending from Upper Thames-street to the river Thames, being now utilised by the firm. On the top floor is the stone and chimney-piece department, which has been rearranged and provided with a glazed roof, and on a higher floor, at the rear, is a new department, which is used exclusively for sanitary goods and which, like the floors below, extends to the river front. The good's lift has also been extended to

this floor. The floors below are all used for the storage or display of Messrs. McDowall, Steven, & Co.'s specialties. The good's yard, extending from the front entrance to the river, has been covered in with an iron and glass roof, the work being carried out by Messrs. Croggon & Co. The general contractor was Mr. Charteris, the architect being Mr. H. Percy Moncton, 32, Walbrook, E.C.

**SUNDAY-SCHOOL BUILDINGS, NORWICH.**—New Sunday-school buildings in connexion with the Primitive Methodist's Chapel in Cowgate-street, Norwich, have just been opened. About 700 children can be accommodated in the school-hall. Mr. A. F. Scott was the architect, and Messrs. Scarles Brothers, the builders.

#### SANITARY AND ENGINEERING NEWS.

**SEWAGE WORKS, EATON HALL.**—The Eaton Hall Sewage Works, forming the first section of the Eaton and Eccleston Sewage Disposal Scheme, designed by Mr. Albert Wolheim, M.Sc., Inst. C.E., under instructions from the Hon. Cecil J. Parker, agent to the Duke of Westminster, have just been opened. The sewage is treated by the Amiens process.

**SEA WALL, DYNCHURCH, KENT.**—The report of Mr. Wolfe Barry and Messrs. Coode, Son, & Matthews, the engineers called in to report upon the damage to the Dymchurch sea wall by the recent gales, just presented to the Romney Marsh authorities, and now under the consideration of a Committee of the "Lords of the Level of Romney Marsh," shows a very serious state of things. The report is of great length, and considers the wall to be in a critical condition, with the danger, in case of further heavy gales, of possible inundation of the marsh—which is from 8 ft. to 12 ft. below high water at spring tides—with consequent risk of destruction of property and stock, and possibly human life. The scheme recommended by the engineers involves an expenditure of 47,000l., the experts remarking in their report that they regret that they cannot recommend less costly works. The scheme recommends thirteen groynes between the Canal and Willup's sluices, twenty-three groynes to the westward of the sluices, and seven groynes on the War Department portion in front of the Grand Redoubt. The outlay, if borrowed for twenty years, would require a "scot" of 3s. per acre for the first year, the interest diminishing year by year. The further consideration of the matter has been adjourned by the Court for a fortnight, and the War Department are to be approached with regard to the groynes recommended on this portion. A large party of workmen have been engaged in temporary works on the wall, and a "scot" of 1s. has already been made to meet current expenses. Our reporter states that many of the oldest inhabitants disagree with the necessity of the extensive works recommended. At the back of the sea-wall is a puddled clay bank, supposed to have been constructed by the Romans, which, two years ago, proved to be capable of resisting the ingress of the sea, and they consider that this, with less extensive works, would be sufficient to protect the marsh.

**SEWAGE DISPOSAL WORKS, BRACKNELL.**—Major-General Crozier, R.E., held an inquiry at Bracknell on the 2nd inst., to consider an application for a provisional order to purchase 242 acres of land for sewage disposal works. The sewage is to be purified by irrigation, two pumping stations being necessary, one at each end of the town. Mr. W. H. Radford, C.E., of Nottingham, is the Engineer to the scheme.

**SEWAGE SCHEME, BARNOLDSWICK, YORKSHIRE.**—A Local Government Board inquiry was held on the 1st inst. by Mr. John Bird Clarke into an application by the Barnoldsrick Local Board to borrow a loan for works of sewerage and sewage disposal. Dr. Holt, of the firm of Messrs. Brierly & Holt, engineers, explained the scheme, and stated that the method of sewage treatment to be adopted was that known as the International system. There was no opposition to the scheme, and the inquiry terminated in the usual manner.

#### FOREIGN AND COLONIAL.

**FRANCE.**—M. Maurice Leloir, the painter, has organised an interesting exhibition, at the Georges Petit Gallery, of 250 drawings made by him for the illustration of Dumas' celebrated romance "Les Trois Mousquetaires." The Minister of Public Instruction has filled up three vacant posts in the list of architects to the "Commission des Monuments Historiques," by the appointment of MM. Benouville, Nodet, and Roy, architects who were already attached to the Commission in subordinate positions.

The Municipal Council of Paris has determined to remove the horticultural gardens and greenhouses in which the flowers and shrubs for the parks and promenades of Paris are cultivated, from their present position in Avenue Henri Martin to Boulogne. A Municipal School of Horticulture and Botany is to be formed in connexion with this establishment. The Ecole Polytechnique, which is about to celebrate its centenary, has commissioned M. Maximilien Bourgeois, the sculptor, to prepare a commemorative medal; while M. Dupain, the painter, has also been requested to prepare a large

allegorical picture, in the form of a triptych, to be placed in the Salle d'Honneur of the Ecole. Joseph Blanc, the painter, has been appointed to succeed the late M. Yvon in the Conseil Supérieur of the Ecole des Beaux-Arts. The jury of competition for a Mairie at Bagnolet has commissioned M. Pierre Vauthier to carry out the work. The Chamber of Commerce of Orleans Loviet has demanded from the Minister of Public Works the concession of a canal from Combs to Orleans. The town of Orleans gives a million francs towards the work, and the Chamber of Commerce promises a further subscription of 200,000 francs. A committee has been formed to raise a statue at Bry-sur-Marne to the memory of Daguerre, the inventor of photography. Sarrazin, Inspecteur des Monuments Historiques, whom was entrusted the conduct of the archaeological investigations at Timagad, in Africa, has been appointed architect-in-chief for the "Monuments Historiques" Department for the region of Sahara. It is announced that new electric locomotives will soon be seen on the Paris, Lyons, Mediterranean Railway; locomotives of a singular appearance, called "Coupe-Vents," the construction of which is just being completed in the workshops at Oullins. The part of these engines will be pointed in order to offer the least possible resistance to the wind. It is stated that the Municipal Council of Paris intend to put an end to the "Bourse Travail," which in fact has remained closed since riots of last year. A large allegorical painting designed by M. Bonis (selected in a competition being fixed up in the Hotel de Ville, Paris. It is to be surrounded with a decorative border, to be designed by M. Mouré, architect.

#### MISCELLANEOUS.

**PULPIT, EAST BUDLEIGH SALTERNTON CHURCH.**—A new pulpit has been erected in East Bud Salternton Church to the memory of Robert Hay Lipscomb. It is of oak and designs prepared by Mr. G. H. Fellowes Prynne, F.R.I.B.A., the work being executed by Messrs. Hems & Sons, of Exeter. The cost, when complete, will be 270l. There are four panels. The figures are in high relief, under arched canopies.

**THE EAST LONDON ANTIQUARIAN SOCIETY.** The members of this society visited on the 1st inst. the halls of the Barbers and Parish Clerks Companies. At the former the visitors were received in the court-room by Mr. Sidney Young, F.R.S., the Upper Warden of the Company, who gave an account of the guild, showing the origin and development of the seemingly incongruous union of bar and surgery. Attention was called to the picture especially to Holbein's picture of the Presentation of the Charter by Henry VIII., and Vandyke's portrait of Inigo Jones. Leaving the Barber-Surgeon's hall the members were conducted to the seventeenth century upper-chamber in Silver-street, which formed the hall of the Parish Clerks. The Master Wardens received the visitors. The master, in subsequent remarks, alluded to the very foundation of the guild, the work of the Parish Clerks in mediæval times, and to their association with Clerkenwell and the miracle plays.

**PROPOSED EXHIBITION OF WORKS OF ART AT PEEL PARK, SALFORD.**—It is intended, in connexion with the jubilee celebration of the borough of Salford, to hold an exhibition of paintings, other works of art, which will be publicly open at Peel Park Museum on April 16—the sixtieth anniversary of the day on which the charter of incorporation was received. The art galleries lectures sub-committee, to whom the arrangements have been entrusted, have already received promises of assistance from private collectors in and around Manchester, as also from Sheffield, Newcastle, Nottingham, Liverpool, Leeds, Glasgow, Edinburgh, Bradford, and Birmingham, and there is reason to believe that a valuable collection of modern works of art will be brought together. The exhibition will be in the Langworthy and two adjoining galleries, and will also extend to the walls of the rooms on the ground floor. These are all in the process of being redecorated. The chief manufacturers have been invited to send contributions representative more particularly of the textile industries of the district. So far the appeal met with a satisfactory response. —*Manchester Guardian.*

**TRADE—IN THE NEWCASTLE BUILDING SOCIETY.**—On the 8th inst. a meeting of the representatives of the Master Builders' Association of those of the Building Trades Federation of workmen was held in the County Hotel, Newcastle, for the purpose of drawing up a basis of a Convention Board for the settlement of all future disputes in the trade. The chair was occupied by C. Moore Esq., who acted successfully as mediator in the dispute. Inquiry was first made whether the terms of the settlement had been carried out by both parties, and it was agreed

\* If it is supposed that any perceptible decrease in resistance will be obtained by this means we think the projectors will be disappointed. It is unquestionable that resistance of the wind to the passage of a train open much more powerfully along the side of the train than against the front of the engine. —*Ed.*



had on the whole, the men stating that, with or two exceptions, all the hands had been re-employed. The conference then drew up a basis for Conciliation Board, the rules of the Board which in operation in the iron trade being adopted. In certain alterations applicable to the building trade. It was decided to submit the rules for approval to the full meetings of each association, the conference adjourned.

**UNGSLEY MEMORIAL, HOLNE, DEVON.**—A rich stained-glass window, representing the coronation of the Magy, has just been erected in memory of the late Charles Kingsley, in the church of his native place, Holne, Devon. In tracery are a bust of Kingsley and his armorials, the bugle-born and crest on either side, while the foot of the window runs the inscription:—"In the glory of God, and in pious memory of Charles Kingsley, born and baptised in this parish, died at Eversley, Hants, 1875." The work been designed and executed by Messrs. Mayer & Co., of Munich and London.

## LEGAL.

## LIGHT AND AIR ACTION:

LILLICO v. COLLS.

On the 13th inst., in the Chancery Division, Justice Stirling had before him the case of *Lillico v. Colls*, which had been before the court several days previously. It was an action brought by the plaintiff, Robert Lillico, of London, to restrain the defendants, Messrs. Colls & Sons, Coleman-street, in the city of London, by injunction, from continuing to erect a building so as to obstruct or darken the windows and light of the plaintiff's messuage, known as No. 1, Maddox-street, Regent-street. Mr. Graham Hastings, Q.C., for Mr. Colls represented the plaintiff; and Mr. Hannell, Q.C., and Mr. Fellowes were for the defendants.

Mr. Graham Hastings, in opening the case, read correspondence which had taken place between parties prior to the present proceedings being instituted, and which resulted in a failure of the plaintiff to settle the difficulty amicably. The writ issued on January 5 last. He would proceed to show, by the model produced, what he thought would be quite sufficient to show that the defendants did not go on building without blocking out large amount of sky. The height of the new building to the front of the coping at its highest was 47 ft., while the plaintiff's house at its highest was 31 ft., and a great deal of light came in there from the northwards. A great block of buildings then put up where there was none before, and effect had been to obliterate the sky to the plaintiff's named.

Mr. Robert Kerr, architect, and District Surveyor St. James's, Westminster, spoke to visiting plaintiff's premises in Maddox-street, and he said that on the first floor a milliner carried on business. He was disappointed generally at the provision of light for the house, and in the opinion witness the effect, when the building was completed, would be to materially affect the light accessible to the first floor of the front shop.

Cross-examined by Mr. Hannell, witness said: "I saw the plaintiff's room on the milliner's, and I said that this was a very dismal room for carrying on business in. You would agree with me you knew as much about ladies as I do. I can further explained that the ladies loved to have as much light as possible when they went to the windows with their bonnets."

Mr. Edward Clarke, architect and surveyor, gave evidence. Mr. Hannell, for the defence, submitted that away a ray of light did not constitute a legal right; and the real point at the bottom of this was whether they had taken away something substantial and material. The learned counsel stated upon the manner in which this litigation had been lodged, and characterised the affidavits of the plaintiff as untrue.

The learned judge said that since the case was before him he had had an opportunity of seeing *locus in quo*; and he had also read through his own evidence in the light of the experience had gained by his examination of the place. The result had been to lead him to be dissatisfied with the evidence on both sides, and he said this without, in any way, putting blame to any person giving evidence in the case. The testimony was simply subject to the ordinary human infirmities; and the conclusion became as this: That the case ought not to be disposed of without his obtaining the assistance of a report by independent expert, as to the alterations which should be made in accordance with the evidence before him. He should, therefore, propose to the case to a referee who he should direct to inquire whether the buildings, if completed in accordance with the plans, would materially obstruct the light; he gave instructions as to how this had to be carried out, and also ordered an inquiry as to damages.

Mr. Graham Hastings said it would be useless on his part to proceed after what had fallen from his ship; and he supposed that what they had

better do was to let the matter stand over generally pending the referee's report?

His Lordship: Yes.

Counsel subsequently stated that they had agreed upon Mr. H. Currey as referee.

## DISTRICT SURVEYOR'S FEE.

MEESON v. CONSTRUCTIONAL IRONWORKS CO.

A CASE was tried in the Queen's Bench Division, on the 13th inst., before Justices Cave and Wright, relating to district surveyor's fees. The respondent company had erected at the pavilion of the Hackney Infirmary, Homerton, a porch, chiefly of iron and glass. The District Surveyor subsequently discovered it and claimed 5*l.* as the statutory fee, based on the area of the pavilion and the porch together. The company objected to this claim, because the payment of the fee was not included in the specification of the work.

The District Surveyor summoned the company, and the Magistrate decided that the porch was not such an addition as entitled the District Surveyor to a fee, but granted a case.

Mr. Justice Wright said: I cannot understand how the Magistrate came to this strange decision. The District Surveyor is entitled to 30*s.* the fee for a building not exceeding 400 square feet in area—15*s.* half the fee—but he has claimed 5*l.*, which he is not entitled to.

Counsel for the District Surveyor pointed out the *note bene* to the second schedule, and that the amount of the fee, should one be due, was not disputed.

Judgment for the respondent company with costs.

## MEETINGS.

FRIDAY, MARCH 16.

**Architectural Association.**—(1) Mr. F. E. Masey on "Modern Architecture in the East End of London" (2) Mr. Theobald Moore on "Old Architecture in the East End of London." 7.30 p.m.

**Sanitary Institute (Lectures and Demonstrations for Sanitary Officers).**—Dr. Arthur Newsholme on "Nature of Nuisances, including Nuisances the Abatement of which is Difficult." 8 p.m.

**Institute of Civil Engineers (Students' Meeting).**—Messrs. S. Henry Barracough and Lionel S. Marks on "Coal Storage in the United States." 7.30 p.m.

SATURDAY, MARCH 17.

**Architectural Association.**—Visit to the Tower of London.

**Sanitary Institute (Lectures and Demonstrations for Sanitary Officers).**—Visit to Barking Sewage Outfall Works.

**Royal Institution.**—Lord Rayleigh on "Light, with Special Reference to the Optical Discoveries of Newton." VI. 3 p.m.

**Glasgow Architectural Association.**—Visit to Paisley. **Queen's College, Cork.**—Mr. Arthur Hill on "The History of Architecture." X. 3 p.m.

MONDAY, MARCH 19.

**Royal Institute of British Architects.**—Adjourned Discussion on the London Streets and Buildings Bill. 8 p.m.

**Society of Arts (Indian Section).**—Mr. Joseph Walton on "Indian Railway Extension: its Relation to the Trade of India and of the United Kingdom." 8.30 p.m.

**Leeds and Yorkshire Architectural Society.**—Mr. W. Hennan on "Hospitals." 7.30 p.m.

**Builders' Beneficial Institution.**—Committee meeting. 5 p.m.

**Liverpool Architectural Society.**—Mr. Aldam Heaton (London) on "Decoration." 6.30 p.m.

TUESDAY, MARCH 20.

**Institution of Civil Engineers.**—Discussion on Mr. E. Collins's paper on "The Prevention and Detection of Waste of Water." 8 p.m.

**Sanitary Institute (Lectures and Demonstrations for Sanitary Officers).**—Professor A. Bostock Hill on "Trade Nuisances." 8 p.m.

**Royal Statistical Society.**—Paper by Mr. Charles Booth. 7.45 p.m.

WEDNESDAY, MARCH 21.

**Carpenters' Hall, London Wall (Free Lectures on Matters Connected with Building).**—Professor Silvanus Thompson on "The Production of Electric Motive Power." 8 p.m.

**British Archaeological Association.**—(1) Mr. R. Lloyd on "The Origin of Parish Church Building." (2) Mr. J. T. Irvine on "Discoveries at Repton Church, Derbyshire." 8 p.m.

**Institution of Civil Engineers.**—Students' Visit to the Tottenham and Forest Gate Railway.

**Builders' Foremen and Clerks of Works Institution.**—Ordinary Meeting of the Members. 8.30 p.m.

SATURDAY, MARCH 24.

**Edinburgh Architectural Association.**—Visit to Science School.

## RECENT PATENTS:

ABSTRACTS OF SPECIFICATIONS.

1,582.—ARTIFICIAL MARBLES: *F. Grand-Montagne* (Brussels).—According to this patent artificial stones are made by mixing cement with pulverised marble, &c., and then adding zinc oxide. Suitable methods are employed for colouring, and the veining is arranged by the employment of stained silk threads.

1,589.—SASH WINDOWS, &c.: *G. Glasen*.—This patent relates to fittings, fire-escape support, and safety-bars in connexion with the sash-window frames. The frame or frames provide for cords and safety-bars, and also furnishes a receptacle for a fire-escape when desired.

1,580.—CHIMNEYS OR VENTILATING SHAFTS: *H. N. Godward*.—To prevent down-draughts a metal cone, closed at the bottom end, is, according to this invention, inserted in the top of the chimney, receiving a second cone, open at

its narrow bottom end, and enlarged at its top end so as to form a deflecting surface. Air striking the top of the chimney is diverted upwards, preventing down and causing an up-draught.

1,576.—DRAIN-PIPES, &c.: *R. Peffer*.—The pipes or traps are made of the subject of this invention, are fitted with hand holes or "eyes," which, in their turn, are fitted with removable covers. These are cemented in position, and the drain tested. In the event of a choked drain, the covers would be removed, the drain cleared, and the covers cemented on without disturbing any of the jointing of the drain-pipes. There would be no necessity for breaking any of the pipes if choked.

1,607.—SASHES, CASEMENTS, &c.: *H. J. Cooper*.—This invention relates to a fastener in form not unlike the old-fashioned catch in general use, but it has plates, springs, and a locking device which gives much greater security.

1,615.—SASH-FASTENER: *R. H. Fraude*.—The catch which is the subject of this invention in this instance is, unlike the general form, being a looped link falling on a hemispherical cone or catch, with a notch. In drawing this together, the two sashes are drawn close, and rattling prevented.

19,993.—VENTILATING BUILDINGS: *R. Lofthouse*.—Steam at low pressure is used for ventilating and moistening the air, and suitable pipes are fixed for the delivery and exhaust.

23,818.—ROOFING TILES: *E. Wulke*.—Roofing tiles of cement, with grooves on one side fitting into tongues on the other, are made so that each will dovetail into the other and form a complete bond over the whole of the roof.

3,106.—CEMENT: *W. Webster*.—An improvement on a previous patent (No. 11,765—1892), by which ashes obtained from the burning of vegetable fibre, straw, rushes, reeds, &c., are mixed with the clay and chalk, then burnt, and formed into cement in the ordinary way.

4,178.—DRIVING CLAY: *R. Taylor*.—The floor of the place where the articles are to be dried is, according to this patent, levelled and concreted. Over the floor slatted sheets are supported on pillars from 3 to 18 in. high. This equalises the temperature, and gives better results in drying.

4,440.—OPENING FANLIGHTS, VENTILATORS, &c.: *E. Drew*.—This invention has for its object to facilitate the opening of ventilators, &c., at any height by a person standing on the floor. An endless cord is made to pass over a grooved pulley, and causes the pulley to travel on a screw quadrant carrying the sash along with it to the required distance, and remaining fastened in any position.

When the window is closed the screw slides out of the way of the window-blind. Two split pins hold the mechanism together, and by the removal of these the pulley is at once lifted clear of window for cleaning, &c.

4,625.—VENTILATING ARM OR PIPE FOR TRAPS, &c.: *E. Boyd*.—This is a novel form of bend in the ventilating arm from the top of a water-closet or lavatory-trap designed to assist the flow and prevent back pressure or draught.

6,088.—DRAIN-PIPES, &c.: *P. Stewart*.—A branch pipe instead of inclining extends at right-angles in a line parallel with the surface of the ground. At the end of the pipe is a well with a grating or cover so as to allow the well to be emptied, and prevent stones, &c., from gaining access to the trap.

6,310.—SAW BENCHES: *A. Bridgman*.—A sliding or canting table is provided with automatic means for gripping or holding the work, and releasing its grip or hold as it arrives near the end of the backward motion. A slow motion towards the work and a quick return are also controlled by mechanical devices.

6,028.—IMPROVEMENTS IN WATER-CLOSETS: *T. W. Twyford*.—A somewhat elaborate arrangement of mechanical details is provided, having for its principal object "the concealment, hooding over, and protection of the seat action," so that nearly the whole of the mechanism employed in connexion with the closet is hidden from view.

7,786.—WOOD VENEERS FOR WALLS: *A. J. Boulton*.—The sheets of veneer are made of such a size that when it shrinks or swells, according to the dryness or moisture of the atmosphere, warping or splitting is prevented, the corrugations simply flattening out or drawing in with the changes of temperature.

## NEW APPLICATIONS FOR LETTERS PATENT.

FEBRUARY 19.—3,495, L. Tebbutt, Covering Bricks, Walls, and Similar Surfaces with a Glazed or Enamelled Surface.—3,513, M. Fitzpatrick, Sanitary Drain-pipes.—3,527, W. Foster, Raising and Lowering Sash Windows.—3,544, R. Baxendale, Chimney Pots, &c.

FEBRUARY 20.—3,556, J. Mackie and H. Sutton, Bracing or Fixing Scaffold-poles, Ladders, &c., by means of a Grip or Cramp.—3,598, M. Fitzpatrick, Sanitary Drain-pipes.—3,608, H. Johnson, Ventilators.—3,622, H. Weeden and W. Wilson, Staples or Fastenings for Glass or Iron in Roofing.—3,645, S. Fairall, Sash-fastener.—3,679, J. Hawthorn, Pottery Kilns.—3,689, J. Aitken, Latches for Windows.

FEBRUARY 21.—3,703, G. Brown, Draught Check.—3,708, J. Mair, Window-sashes.—3,745, R. and T. Way, Sash-fastener for Windows, &c.—3,747, J. Hargreaves, Combined Chimney Pot or Cowl for the Prevention of Down-draught in Chimneys.—3,743, G. Clarke and others, Gullies for Sinks, Down-spouts, &c.—3,757, A. Hanneborg, Ditching and Tile-laying Machines.—3,763, J. Featherstone, Sash Window-frames.

FEBRUARY 22.—3,785, A. Ransom, Cowl for Preventing Down-draught, Excluding Wind and Rain, and Creating an Upward Current of Air in Chimneys, Drain-ventilators, &c.—3,802, R. Ames and L. Crosta, Jointing Drain and Sewer-pipes.—3,803, T. Harris, Artificial Stone, &c.—3,813, M. Brooks, Window-sashes.—3,836, H. Dickinson, Fire-resisting Construction.—3,864, C. Bonney, Dies of Brick and Tile-making Machines.

FEBRUARY 23.—3,886, A. Wynn, Air Bricks.—3,913, W. Potter and J. Cornish, Fixing Tiles to Walls, Ceilings, &c.

FEBRUARY 24.—3,970, L. Shepherd, Screws.

FEBRUARY 26.—4,047, G. Ralston, Automatic and Pressure-closing Water-tight Door.—4,068, A. Cope, Sash Windows.—4,084, J. Franz, Spring or Weight-Actuated Blowers or Ventilators.—4,090, L. Delmas, Roofing.—4,095, H. Cleaver, Mortise Locks.

FEBRUARY 27.—4,120, J. Thomson, Panels or Linings for Roofs, &c.—4,124, J. Merrill, Water-closet Cisterns.—4,131, A. Davey, Set-squares and T-squares.—4,166, J. Parker, Preventing the Bursting of Water-pipes.—4,173, W. Cook, Ventilating Shafts for Sewers, &c.—4,201, F. Sly, Varnish.

FEBRUARY 28.—4,223, P. Baunert & A. Pieck, Artificial Stone or Marble.—4,229, W. Kemp and others, Glazing Bars for Glazing Roofs of Railway Stations, &c.—4,25



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## ILLUSTRATIONS.

East Window, St. James' Church, Gerrard's Cross, near Slough.—By Messrs. Shrigley & Hunt.....	Double-Page Ink-Photo.
"Binghams Melcombe," Dorsetshire; as Repaired, with Partial Additions.—Mr. Evelyn Hellicar, A.R.I.B.A., Architect .....	Double-Page Ink-Photo.
Design for a Country House.—By Mr. Richard Willock, A.R.I.B.A. ....	Two Single-Page Ink-Photos.
Restoration of Rood Screen, St. Mary's Church, Beverley.—Messrs. Botterill, Son, & Bilson, Architects .....	Single-Page Photo-Litho.
Proposed Private Chapel, Longford Castle, Wilts.—Mr. G. H. Gordon, A.R.I.B.A., Architect .....	Single-Page Photo-Litho.

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## The Building Exhibition.



THE Building Exhibition at the Agricultural Hall is undoubtedly a better one than the recent exhibitions under the same title, but it can hardly be said that it bears out all the very large promises that have been made in regard to it. There is less of the mere advertising element than usual, and there are certain number of exhibits offering something of special interest; but so far as we have been able to observe as yet, no department of building materials or methods is at all completely represented. The collection is in a somewhat more complete state than we have been accustomed to find exhibitions of this kind at their opening, but there were still on Tuesday a good many exhibits incomplete or not set up at all; and the catalogue, four days after the formal opening, was still not forthcoming. Hence a first review of the exhibition must necessarily be partial and incomplete.

It may be suitable to commence with some remarks on the exhibits of that class of raw material which is most especially the basis of architectural construction—viz., building stone, natural and artificial. The exhibits in this class, we are rather surprised to find, are not as numerous as usual. The best display is that of Messrs. W. Garstin & Sons, which, however, is not as large or varied as last year. In addition to the usual British and Swedish stock granites the firm show some samples from Baveno and from, on and near Lake Maggiore, Italy. From Baveno there are two kinds: one is light tint, spotted pink and black, and not altogether unpleasant in appearance. Its matrix is clear and transparent, orthoclase spar, both white and pink, whilst the mica is bronze-coloured. It takes a fine polish, is rather coarse-grained, and slightly porphyritic. Another sample from the same place is a totally different stone, being salmon-coloured—not unlike the Scotch Corrennie at a distance. In addition to the usual minerals it has iron pyrites in fair abundance—not a very hopeful sign. Moreover, small cavities are very abundant, and the stone, in consequence, takes a very indifferent polish. The introduction of such stone as this into the English market is absurd; no one would buy it who knew good stone from bad. The granite from Alzo,

however, is of most excellent quality, and is a distinct addition to our building stones. It has a tendency to become porphyritic, is of a pleasing light grey tint, and takes a very good polish. The same firm also shows some varieties of American granite from Kinstry and Ardhattan. The fact that it will pay to bring various materials from Lake Maggiore and the United States, respectively, and to polish them in this country, speaks volumes as to the state of the labour market.

The Mangotsfield Pennant Stone Company exhibit different kinds of paving-stone of blue tint, as well as a font to be erected in the village church of Soundwell, Gloucestershire—we trust the parishioners will like its design and general appearance; we do not. For odd-coursed buildings, paving, kerbs, &c., the blue Pennant is a most excellent stone, of its kind (carboniferous sandstone), but we think it is out of place for ornamental work.

Mr. Lindley shows some samples of his building stones from Ancaster and Mansfield Woodhouse, the former being a shelly oolite, and the latter magnesian limestone and sandstone. One of the samples was a piece of blue marble from Ancaster; we wonder how much of it there is in the quarry?

The Patent Victoria Stone Company have, as usual, an imposing exhibit. One of the features is the application of the "stone" for ashlar purposes. It is a pity better samples were not selected for illustration. Some of the ashlar gives signs of efflorescence—or at least markings which look very like it. A new gully-trap, treads, vases, &c., are also shown.

Messrs. A. C. W. Hobman & Co. have samples of their tar paving and Clifton artificial stone; whilst the Plastic Marble Company and Messrs. G. Larivière & Co., of Angers (slate) are also represented.

Of bricks there is but a very meagre show. Messrs. Ellis, Partridge, & Co. have two stands of their red facing-bricks and mouldings, and ornamental bricks and panels which are very good materials of their class. Mr. W. S. Wood has a stand of excellent blue Staffordshire bricks. Messrs. Madeley Wood & Co. have an exhibit of Broseley tiles, not calling for any special remark. "Major's patent pressed tiles," laid without nails or mortar, may be a very good roofing; they look very neat externally; but there is no means of seeing how they are laid and secured, which is the important point. The "Roman tile roof," exhibited by the same firm, is a fine class of tile-covering for a large roof—it would not do for a small one either in

appearance or in its rather rigid and inelastic method of arrangement. Each tile has on its face a half-round hollow roll increasing in diameter from the top to the bottom of the tile, the large end of one roll lapping over the small end of the one next below it. The whole roof as laid has a monumental appearance which is satisfactory to the eye.

Special methods of construction for fire-proof or sanitary objects are fairly represented. We have a large erection of the Cunnah-Wright fire-proof partition walls, the main point in which is the use of two forms of light and well-designed corrugated iron "lathing," which can either be used as a basis for a plaster partition or can be bent round iron beams as a fire-proof casing. The form of partition made by the Fire-proof Construction Company, of which there is an exhibit, was noticed not long since in our columns. It consists of slabs of concrete set on edge, pierced longitudinally with a series of circular tunnels, which combine to give lightness and to check the transmission of sound; the slabs are joined at their edges by a series of metal clips or clamps, specially prepared against rust. This makes a good and thin partition; but while the patentees claim as one advantage that "there is no open space, as in stud partitions, for the accumulation of dust and debris," they seem to forget the open spaces left by their own tubular passages, which, like the space in the ordinary partition, can never be got at or inspected in any way. It is no doubt less liable to be the deposit of dirt or the home of vermin than the interior of the ordinary partitions; the hollow spaces are less accessible; but nevertheless we prefer partitions which leave no hollows. In this respect the partition exhibited by the "Granite Plaster Company" seems even better, though no doubt very thin to look at, and perhaps not so conveniently built up as that of the Fireproof Construction Company. This is exhibited close to and partly in conjunction with Messrs. Haywards' exhibit, as it is formed of the granite plaster, a very hard-setting plaster, run on to Haywards' patent steel lathing as a centre. In this shape it makes a very hard panel about an inch thick, and looks a most clean and durable kind of partition, being solid throughout and with no internal and inaccessible hollows; how far it is really sound-proof there were no means of testing. Messrs. Haywards' lathing is well known to most of our readers as one of the best and strongest metal lathings that has been recently brought out. The Metal Expansion Company have also an exhibit



showing the application of their lighter but very useful and cheaply-made form of metal lathing to various purposes; among others its use for sewage straining, for which it seems very well adapted.

Picking's interlocking fireproof flooring seems a good and inexpensive form of floor, though it looks rather like a suggestion from Fawcett's patent floor. It consists of terra-cotta tubes made in pairs, rounded above and flat on the soffit (except a rib to form a plaster key); each pair has a projection on one side and a corresponding indentation on the other side; when the tubes are in place at right angles to the iron beams (resting on their lower flanges) they also afford each other mutual support by means of these interlocking projections and hollows. It is a cheap, simple, and easily-made floor, and should be of good fire-proof quality. It is finished above by "fire-resisting grout," enclosing both the iron beams and the terra-cotta. In the same connexion may be mentioned Burr's tubular ceiling, which consists in the application of a light tubular terra-cotta ceiling to the underside of a flooring of wooden joists, in place of lathing either wood or metal; the tubular slabs of terra-cotta being hung to the underside of the joists by large plate-headed screws, the latter acting as flanges to hold up the terra-cotta, which is keyed for plaster on the under side. This may make a ceiling more impervious to sound than an ordinary lathed ceiling; it must not be forgotten, however, that it means heavier joists.

Messrs. Beers, of Cologne, promise us, by the use of Hauesler's vulcanite roofing felt, the formation of flat and gravel-laid roofs impervious to wet, and the enjoyment consequently of gardens and promenades on the roofs of our houses. Two firms illustrate the uses of silicate cotton or slag wool: Messrs. Broadbent, who show a section model of a house with the floors pugged with this material, the water-pipes surrounded with wrappings of slag wool on canvas, to prevent freezing (it may be added that this may also be useful to prevent the dissipation of heat in hot water supply pipes), and even a packing of slag wool between a bath and its casing, to prevent the speedy dissipation of heat from a warm bath. This last application is rather far-fetched, and it may be questioned whether this slight advantage in retaining heat is any compensation for the retention also of the useless and insanitary casing. Messrs. F. Jones & Co. also exhibit a stand of slag wool applications and fibrous plaster with a wire strand basis. Wright's patent building and fixing blocks, the latter in strips between courses of brickwork, for forming nailing courses of indestructible material built into the walls, form another item in building materials; and the "St. Paul's Roofing and Cornice Co." treat us to an exhibition of the application of their metal to form "metallic house or stone fronts faced to look like brick, stone, or marble," illustrated by a piece of walling enclosing their room and looking like rusticated masonry made of crumpled tin, which rings at the touch. It is some comfort to reflect that no English manufacturer has perpetrated this; it comes from St. Paul's, U.S.A. We wonder whether there is much of this kind of architecture to be found at St. Paul's; or is this only a bid for the patronage of "the Britisher," who is supposed to be so enamoured of shams as to be ready to rise at anything?

Among exhibits of more or less decorative character Messrs. Minton & Co. have a compact and effectively-arranged display of tilings, including a number of good designs for decorative wall coverings in the shape of diaper ornament and dados. The exhibition of Messrs. A. Bault et fils, of Choisy-le-Roi, who have not before exhibited in London, shows some very good terra-cotta work, including imitations of the coloured figure friezes discovered by M. Dieulafoy at Susa; one mistake in these is, however, that whilst the building of these designs in a brickwork

form is apparently adhered to, the material is really applied in squares of considerably larger size, the majority of the joints being sham ones put in to keep up the appearance of the original work, which is a very poor expedient. It would have been more to the purpose, too, to have shown the application of this kind of coloured and glazed brick frieze to modern design, rather than to the mere imitation of Persian work. The same exhibit includes some very good bits of wrought-iron decorative work. The Coalbrookdale Company have done themselves credit by a large and very effectively-arranged exhibit, including wrought and cast-iron work, and a number of chimney pieces, mostly made in iron and painted white, which we do not like, but the designs in themselves are mostly in excellent taste, and include work designed by good artists. We noticed among them a most graceful and original chimney-piece designed by Mr. Lethaby, and a cabinet fire-place (a fire-place with deep-shelving over it) designed by Mr. MacMurdo, decorated with bronze reliefs in illustration of Longfellow's "Village Blacksmith." The large gates in the centre compartment, in which the decorative work is formed of cast-iron conventional foliage rivetted within wrought-iron construction bars, is not, however, happy in effect; the scroll-work suggests wrought-iron while at the same time looking far too thick and heavy for that material, though in itself it is very good casting. In other work—railings, &c., they have contrived to give to cast-iron work something of the lightness and freedom of wrought-iron design, in a legitimate manner. A very good and effective cast bronze stair-railing is one of the best features in the exhibit. Messrs. T. Potter & Sons include some good wrought-iron work, treated quite in character with the material, in their exhibit, as well as the style of brass lamps for which they are well-known. The St. Pancras Ironworking Co. would have been wiser to have dispensed with their cast-iron "ornamental" work, or to have got some better designed for the occasion; it may take the taste of builders, it is very poor stuff in the eyes of architects. Their practical exhibits are very good, and their balanced cellar flaps, though not really "balanced," are an ingenious application of the spring to lessen the lifting weight of these heavy horizontal iron frames fitted with prism glazing. Mr. Jetley's carton pierre work is very good and delicate in execution, especially in the Oriental types of ornamental design. The wall-papers of Messrs. Woollams & Co. are as good as usual; it is rather surprising that there is not more of this class of work, of which we generally see a good deal in building exhibitions. Messrs. Woollams' exhibit includes a new form of flock paper, the "Chameleon," by which effects of broken colour, hitherto not attainable in this material, are produced. Of parquet flooring we have exhibitions by Mr. Turpin and Mr. Bassant; and there is a very good and elaborate exhibition by Mr. Samuel Elliott, of the Newbury Steam Joinery Works, of specimens of wood mouldings, and of various woods treated and finished in different manners. Of its kind, this is one of the most complete exhibits in the building. The Linoleum Tile Co. exhibits floor-cloth patterns which we presume are intended to justify or illustrate their title by being all designed in square forms such as are suitable to tiling; but in spite of the fact that linoleum is used in positions where tile flooring may be and often is used, there is no particular reason in treating linoleum in this manner, seeing that it is something essentially different from tiling; moreover, the colouring is harsh and crude, which is often the case in linoleum goods, but need not necessarily be so.

Among the materials for decorative use is what is exhibited as a new one under the title of "Dækorin," by Messrs. H. & H. Hooydonk. The object of this is to substitute something for carton pierre which will

be equally available for cast surface ornament, while harder and more durable. It is maintained that this material is as tough as wood, and will rather indent than crack under a blow, and that all relief and mouldings executed in it are part of the ground and not fixed on. We have not had the opportunity of testing all these qualities, but the hardness claimed for it it appears to have, and we have seen that it is susceptible of fine finish in modelling. As materials of this class it is therefore worthy of attention.

Among the sanitary exhibits one of the most important is the wrought-iron water pipe with tin lining, patented and exhibited by Mr. E. Walker, and which is called "Health Pipe," and is put forward as the best pipe yet invented for the conveyance of domestic water-supply. The wrought-iron pipe is made first, and the tin lining drawn through it by a mechanical process which leaves it absolutely cohering with the iron, so that a notch cut into the pipe anywhere has the effect of being cut into a homogeneous material, the tin merely showing a thin white line on the interior of the section. Though the pipe will bear bending to some extent, it is of course not ductile in the sense that a lead pipe is, and the system of piping has to be provided with bends and joints, like a drain-pipe system on a small scale. The device of lining lead pipe with tin of course started many years ago; but it appears to be a difficulty in dealing with tin, owing to the fact that it is almost impossible to make joinings with the lead without some extent fusing the tin, which is thus in an imperfect state as a screen to the lead. We have had some correspondence previously on the subject of this pipe, with the patentee, who wishes us to accept it as necessary sanitary improvement for water conveyance everywhere. It is assumed that London water does not act on lead so as to imbibe any injurious quality from it. It is denied by those interested in the patent. We have however the evidence of a chemist who carried out some experiments on this point, to the effect that the result had convinced him that lead had no appreciable effect on London water; and in that case we could hardly recommend the London public to employ a pipe which its patentees admit to be about double the cost of lead-pipe. Nevertheless, apart from the question of cost, it appears to us to be the very best pipe for the conveyance of water for household supply that we have seen; and in soft water districts, where lead notoriously will withstand the action of the water, it may well worth its cost; it is certainly far more reliable than galvanised iron, and makes a far cleaner conduit.

Among other miscellaneous exhibits noticed two more of the numerous devices for taking out window-sashes for cleaning. Manning's "Fin de Siècle Window" is a system specially adapted for application to existing windows; the beads are cut loose and fastened in with removable pins, and the sash can be lifted and turned on a stand inserted in the frame for hanging the head of the sash on temporarily, while turning it. The only special advantage of this method is that it can be applied to existing windows without cutting up the work more than is involved in making the heads removable. Messrs. Gibbin & Sons' sliding sash is one which dispenses with cords, the sash being raised and lowered by a small windlass handle, key fitting on the arbor of a cogwheel with the side bar of the sash, which works on continuous ratchet in the frame. Metal rollers are fixed in the sash on the opposite side to work against the frame and prevent jamming. Any method of raising and lowering sash windows which dispenses with cords and boxes deserves attention; this one works very well in the small window exhibited, but one must try it on a large one to be sure of its efficiency. The drawbacks are that the projecting arbor and the cogwheel looks rather unsightly, and that



the key may be mislaid, when the sash cannot be raised. The inside moulding which confines the sash is made to open on hinges, when the sash can be withdrawn bodily; but this also will not work so well with a large and heavy window as with a small one. Messrs. Peace & Norquoy's

folding partition is a useful method of forming a partition which can be drawn back at pleasure; the partition is formed like four doors hinged together and capable of being turned on their hinges and folded up against one side of the opening, the four leaves of the partition being guided, when pushed back, by metal projections in the centre of the bottom-rail of each division, which slide in a metal groove on the sill, the centres of the four leaves being always in a line. The Silent-Step Flooring Company exhibit their steps composed of india-rubber cubes set in square holes in a steel foundation-plate, the india-rubber going through the holes and being expanded by pressure on the under side so as to be entirely secure. In connexion with this subject we may also mention Mr. Gooding's "interchangeable" treads, also consisting of squares of india-rubber in square sockets on the floor of the step, so made that when the centre pieces become worn by traffic, they can be easily taken out and put in again at the sides, the unworn side pieces being removed to the centre position.

Along with Angell's air-tight covers for drains, which have been noticed in our columns, is exhibited Mr. Shoppee's registered manhole cover for drains, which is made with a surface as nearly as possible resembling that of granite paving, and calculated to give a good foothold for horses and prevent slipping on the cover.

Mr. Robert Adams's exhibit contains some very good examples of fanlight openers, worked by screws, which act admirably; also the "universal opener," a rod fixed on the fanlight sash so as to move in any direction, and with an ingenious arrangement at the end of the handle by which what appears to be a straight handle can, by slipping off a sheathing, be transformed into a winch-lance turning the bar and operating the screw for working the fanlight. The advantage of this is that it can be taken to any part of the room as easily as a cord. Mr. Adams's door-springs, which are well-known, are included in the same exhibit.

Among bolts the "Paragon" bolt is a new one deserving attention for its simplicity and efficiency. It is a circular bolt working inside the door-stile in a centre-bit hole, and bolting not into a metal socket fixed to the frame and depending only on the strength of the attachment, but into the solid wood of the frame. The socket-hole is elliptical in shape (vertically) to allow for any slight fall of the door on its hinges. The bolt is worked by a small handle projecting through a slot in the stile sufficiently long to allow of the necessary extent of slide. Altogether this is a very efficient bolt, with nothing to get out of order.

The Sanitary Bath Company's steel-clad copper bath has been before noticed by us; the examples exhibited must persuade everyone that, for a comparatively low-priced bath, this is one of the best and cleanest baths that can be had; the burnished surface of the interior is practically indestructible; the annoyance of seeing a bath look dirty inside from the wearing off of paint or enamel and the recurring expense of its frequent renewal, are entirely avoided and we have a bath the inner surface of which looks always bright and clean; and the prices are really very low considering the excellence of workmanship and material. Among other exhibits connected with sanitation may be noticed, alongside of Moule's well-known earth-closets, the automatic peat-dust closets exhibited by the Moss Litter and Peat-lust Closets Company. As a sanitary reodoriser the peat dust seems an admirable material, but the automatic working, which takes place on closing the lid, is not all that it might be; in one of the specimens the discharge seems meagre and

insufficient, in another the peat dust is to some extent scattered on the seat in discharging, which is untidy and inconvenient. If this were remedied, these closets are in other respects very desirable in cases where the water-closet cannot be used or is disapproved of.

Other sanitary exhibits, and a good many others of various kinds, we may be able to notice in another issue, before which time it is to be hoped that a catalogue will be forthcoming.

#### NOTES.

**T**he annual conference of the Associated Chambers of Commerce last week Sir Courtenay Boyle remarked that the Board of Trade is promoting four Bills this Session, all dealing with matters of great interest to the commercial community, one of which will, of course, deal with the railway rates question. It was inevitable that some action should be taken by the Government in view of the recommendations of the Select Committee, and the President of the Board of Trade has already announced his intention of bringing in a Bill as the outcome of their Report. He assured the Chambers of Commerce that the measure will not fall short of the Report, remarking that he does not expect it to give satisfaction to everybody, and that the railway companies will probably denounce it altogether. From this it may be surmised that it will be in the direction of rendering previous legislation more effectual. There is evidence of a widespread desire to make the Board of Trade a final authority in determining actual rates, but both the President and the Permanent Secretary of the Board take every opportunity of deprecating and discouraging this, and Mr. Mundella's proposal will probably take the form of a cheaper and more accessible tribunal in the place of the Railway Commission. A representative from Sunderland drew attention to a matter we have previously remarked upon—viz., the inability of the public to ascertain the correct distances for which railway companies are entitled to charge in conveying passengers and merchandise; and efforts will be made to remedy this.

**O**UR readers will have noticed that a conference has just been held at Newcastle-on-Tyne, at which a basis for a Building Trades Conciliation Board for the Newcastle district was drawn up.\* It is very satisfactory to note the rapid extension of this mode of settling disputes in the building trade, as well as in the iron and coal trades; much good having already been effected by existing boards. A Bill for conferring additional powers upon Boards of Conciliation will be brought in during the ensuing Session, having been prepared by Sir John Lubbock, Sir A. Rollit, and other energetic friends of trade. It is understood to be on the same lines as previous measures, which have had to stand aside through pressure of Government business. In proposing the toast of the Board of Trade at the Chambers of Commerce banquet last week, Mr. Firth alluded to the President of the Board as the Minister of Conciliation. Mr. Mundella identified himself with the movement in this direction some years ago, and at the recent conference with the sidings owners he referred to the success of the Conciliation Clause of the Railway and Canal Traffic Act. He remarked that he was the parent of that clause, and had a natural fondness for it; proceeding with a tone of pardonable pride, to sum up the result of its working. "This clause," he told the deputation, "has done great service—it is doing great service. Gentlemen get together and discuss the differences between them, seriously, like honourable and sensible men; and the litigious points disappear, and in nine cases out of ten they come to an agreement."

\* See p. 222, in our last issue.

Upon the particular grievance then under discussion, it happened that the railway companies had absolutely declined to accept the opinion of the Board of Trade; and this is one of the few instances of the failure of the clause. The general result of its working forms, however, an excellent precedent; and in addressing the Associated Chambers of Commerce Mr. Mundella again took occasion to allude to it, remarking that negotiation is preferable to litigation, and that a point which is conceded after argument and fair reasoning is much better than that which is wrung either by force or law from an unwilling opponent.

**W**E have received a copy of the rules of a new society formed among the New York architects, under the title "The Beaux-Arts Society of Architects of New York," the object of which is stated to be "to cultivate and perpetuate the associations and principles of the École des Beaux-Arts." Mr. W. A. Boring is the President, and Mr. C. F. McKim the Vice-President. We cannot say that we think this at all a desirable move on the part of the New York architects, as it is not in the best interests of American architecture, and is only likely to foster the tendency, too manifest already, to render American art a kind of French art at second hand, instead of an original movement. We would far rather have heard of the institution of an "American School of Fine Arts," without the French name and the manifest predetermination to follow French guidance. A great nation should have its own School of Art, and not be content with following that of another country, however eminent in art.

**W**E regret very much to hear that the celebrated Roman theatre at Orange is to be "restauré" under the direction of M. Formigé, the well-known French architect. We have no information as yet as to the extent of the operations which are to be carried out under the name of restoration, but we fear that the tendency to do too much to old buildings is even more marked in France than in our own country. The theatre at Orange is a monument of such remarkable interest that any operations which will at all impair its archaeological value are much to be deprecated.

**T**HE British School at Athens has for some time had its eye on Abae as a promising field for excavations. The necessary preliminaries have now been settled, and the Director has, we learn to-day, actually started. News of speedy progress may shortly be hoped for, as the site of the great Temple of Apollo is marked by remains still extant. The time and money so often necessarily spent in trenching will thus be saved. The fame of Abae was in later days much obscured by that of Delphi; it remained, in fact, always to some extent a shrine rather of local than of pan-Hellenic celebrity. Still it cannot be forgotten that Cæsar consulted it, and that in the "Edipus Rex" (899) Sophocles mentions it in conjunction with the oracles of Delphi and Olympia. Herodotus says it was rich in treasure; the Persians sacked it, and the ancient temple suffered again in the time of the Persian War. It was in ruins when Pausanias visited Abae, but he notes that many of the sculptures, votive, offerings and the like had been transferred to a new temple, built by Hadrian. The remains extant in his day were noted by Leake, and the site has remained undisturbed since his time.

**T**HE Congress of French Architects of this year, to be held from the 10th to the 16th of June, will have a different character in some respects from its predecessors. The "Société Académique d'Architecture" of Lyons (the oldest Architectural Society in France) has invited the Congress to meet at Lyons on the occasion of the International Exhibition in that city to be opened in May of the present year,



and the Congress will accordingly meet at Lyons for most of its work, reserving only the following subjects for consideration at central meetings to be held in Paris:—(1) The meeting of the "Caisse de Defense Mutuelle"; (2) the general annual meeting of the Société Centrale; (3) the closing meeting of the Congress, on the Saturday morning; (4) the annual distribution of "Recompenses"; and (5) the closing dinner. The members of the Congress will leave Paris for Lyons on the morning of Sunday, June 10, staying at Dijon to lunch and to visit objects of interest there, and arriving at Lyons on Sunday evening; and at the sittings on the three succeeding days the following subjects will be considered:—

1. "Selection" (the distinction between those who have a proper claim to the title of architect and those who have not); consideration of the course to be adopted by Architectural Societies, &c., in connection with this subject.
2. The development of the "Caisse de Defense Mutuelle," and the means to be taken to increase its usefulness.
3. The "Conseils des Bâtiments Civils" in the Provinces.
4. Property or copyright in works of architecture.

In the intervals of the sittings special visits will be made to the Hôtel de Ville and the museums of Lyons, to the new church of Notre Dame de Fourvières, and to the International Exhibition. There will be a dinner of the members at Lyons on Tuesday, June 12, and an excursion to Bourg-en-Bresse on the afternoon of Wednesday, June 13. The congress will be presided over by M. Daumet, President of the Société Centrale, assisted by the Presidents of some of the Provincial Architectural Societies, and by MM. F. Roux, C. Boileau, and M. Poupinel, Secretaries of the Société Centrale.

**A**MONG the latest of the statistics which Germany glories in publishing, we notice one set treating of the salaries of the large army of public "building officials" in the employment of the various German municipalities. No one will dispute that German cities can nearly always boast of an exceptionally well-managed office of works, working economically and systematically even if not quite up to date at times. It is also well known that the officials are unusually capable men, whose only fault generally consists of a too intense admiration of red tape. As private practice is but seldom allowed, the figures shown in the statistics may be taken to express the *bona-fide* living wage of our "official" German *confrère*. Berlin proper has about 1,600,000 inhabitants. The city architect has about 750*l.* per annum, the departmental chiefs from 330*l.* to 390*l.*, the senior assistants from 250*l.* to 300*l.*, and the juniors from 120*l.* to 180*l.* Leipzig with, about 350,000 inhabitants pays its City Architect between 320*l.* and 370*l.*, whilst the departmental chiefs receive from 180*l.* to 240*l.*, and the senior assistants from 150*l.* to 210*l.*; and in Munich (350,000) and Frankfurt (180,000) they are respectively 500*l.*, or 500*l.* to 600*l.*, 170*l.* to 280*l.*, or 230*l.* to 330*l.*, and 140*l.* to 210*l.*, or 200*l.* to 280*l.* Taken as a whole, we see City Architects of towns of 100,000 to 350,000 obtaining salaries from 400*l.* to 500*l.*, with such exceptions as the above for Leipsic, or Bremen, with its 130,000 inhabitants, which pays 600*l.*. Towns from 50,000 to 100,000 inhabitants pay from 250*l.* to 400*l.*, with such exceptions as Mayence (71,000), which pays 500*l.*. Departmental chiefs in towns of 100,000 to 350,000 receive from 250*l.* to 350*l.*, and assistant architects from 150*l.* to 250*l.*. The old Hanse cities and some of the Rhenish towns pay best, the Saxon towns the worst.

**T**HE recent number of the journal of the German *Limes* investigations on the Roman boundary contains amplifications of Herr Jacob's discovery of the delineation of the Roman boundary in the Taunus, to which we have already referred. Similar discoveries have now been made by Professor Löschke between Tain and

Oberbiber, on the Rhine, and by Dr. Schumacher, at Osterburken, in Baden. In the course of an examination of the *Limes* between Marköbel and Rückingen, Professor Wolf has discovered traces of a number of watch-towers, about half a mile distant from each other, of which the most northern is situated exactly on the present Hessian frontier, about half a mile north of Marköbel. At Langendiebach the Professor discovered traces of a larger fort and of a Roman settlement, probably situated on what was the Roman way from the Main to the Kinzig Valley. The investigation of the course of the *Limes* over the Kirmach valley in Baden was entrusted to Dr. Schumacher. At one part it is marked by a wall of oak and masonry, originally about 3 ft. high, and at Rinsheim there were traces of a fort. Other investigations have been made by Herr Höfler in Hesse, and by Herr Kohl in Bavaria.

**Y**ET another project for a railway up the Jungfrau, in the Bernese Oberland, has been published by Engineer Guyer-Zeller, of Zürich. This time electricity (the power to be supplied by the River Lutschine) is to be the motive power. The proposed railway is to start at Scheidegg (6,700 ft. above the sea), a station on the existing Wengern-Alp Railway, whence the line is to be taken past the foot of the Eiger Glacier, and in a tunnel round the flank of the Eiger to the station of that name (10,100 ft. above the sea). From here a tunnel is to be built to the Jungfraujoch, from the end of which the line is to ascend in a spiral to a point about 200 ft. below the summit, to which the ascent will be completed by means of a lift. The total length of the proposed line is 12.4 kilometres, and it would take four years to build, at a cost of about 350,000*l.*; on which, according to the rather sanguine estimate of the projector, a fair rate of interest would be earned.

**A**N Egyptian granite statue and a part of a granite obelisk have been dug up at Beneventum. According to the *National Zeitung* (from which we take the information), as far as can be judged by the inscriptions, the statue was finished in the reign of Rameses II. (about B.C. 1340), and brought over and set up by the Romans in the temple of Isis at Beneventum. The broken part of the obelisk corresponds exactly to a part of an obelisk already discovered in the same locality; the inscriptions, also, in this case prove the work Egyptian.

**T**HE Ca d'Oro, the well-known palace on the Grand Canal at Venice, has been purchased by Baron Franchetti, the son-in-law of Baron Rothschild. A thorough "restoration" of the building, we regret to hear, is threatened.

**A** NOTEWORTHY landmark of northern London is, we are informed, about to be pulled down and rebuilt. It is the "Old Gate-House" Tavern on the summit of Highgate Hill. A gate-house was erected on that same spot 500 years ago for levying tolls by the Bishops of London, upon the then newly-made North road through Holloway, Highgate (which, Norden avers, is named after the gate itself) and Whetstone to High Barnet. Until that period the main road to the north passed from Battle-bridge, along Maiden (or Black Dog) lane, to Tollington, and so, by Duval-lane and Crouch End, through Hornsey, *olim* Harringhay. But as the earlier route, writes Norden, in his "Speculum Britannicæ," "by reason of the deepness and dirtiness of the passage in the winter seasons, was refused by wayfaring men, carriers, and travellers," Robert de Braybrooke, Bishop of London, granted a new one, as indicated above, to traverse the park, or hunting woods, appertaining to his see; in 1386 he built the toll-house at the park's south-eastern corner, a similar toll-house, called Park-gate being set,

about the same time, at an entrance into the park where the "Spaniards" Public-house now stands. The steep ascent up the hill was subsequently relieved by a side cutting, crossed by the Archway, which was described in a "Note" on June 2 last. The original gate-house spanned the roadway with a flat arch that abutted against the graveyard of the old chapel—a chapel-of-ease to Hornsey parish church. The arch, proving too low for late stage-waggons, was cleared away in 1769 the turnpike that replaced it remained in use until July 1, 1864, when the charge for toll ceased here. The chapel was rebuilt 1575-8 over the site of an ancient anchorite's cell, one of whose hermits, W. Lichfield, had laid out a causeway southwards along the present Highgate Hill and Holloway roads. In 1565, Bishop Grindall had enfeoffed the chapel, with two acres, to the Grammar School, founded by Sir Roger Cholmley, Chief Justice temp. Edward VI. Standing opposite the Gate-house Tavern, it served for worship until the building of St. Michael Parish Church, by Cubitt, after Lew. Vulliamy's plans and designs, and enlarged by Street. In the old chapel, the burial place of Coleridge, were set up monuments to William Platt (1637), founder of some fellowships at St. John's, Cambridge, St. Francis Pemberton (1697), Chief Justice of the Common Pleas, and Lewis Atterbury (a fluted column), for several years rector of Hornsey. The bishop's palace (situated near the present Lodge Hill, Finchley), afterwards the lodgings of Gilbert de Clare, Earl of Gloucester, who married Edward I.'s daughter, Joan, was pulled down at the end of the fifteenth century; the material for the building of Hornsey Parish Church, by Savage and Wareham, Bishops of London. The church tower has remained to our own day; on May 12, 1888, we published Mr. James Brooks's design, with plan for the new church on a site adjoining that of the former, whose tower appears in the drawing. A curious drawing of the Gate-House is placed in the corner of a bird's-eye view of the Ladies' Hospital, William Blake's "Silver Drops or Serious Things." Blake, a draper of Maiden-lane, Covent Garden, founded that hospital, Dorchester House, and his own residence, since Grove House, about 1670. There, to be preserved a pair of buck's horns, mounted on a staff, it being one of the many ideas at Highgate, formerly nineteen in number, *teste* Hone's "Every Day Book"—where the ribald custom of swearing on the horns was practised. The school chapel (J. Crawley architect), which marks the site of that speak of, was richly decorated within, several years ago, by Messrs. Heaton, Butler, Bayne, of Garrick-street, under the superintendence of Mr. C. Pemberton Leach architect. The house wherein Coleridge lived was one of three built on the site occupied by Blake's Hospital. St. Michael's Church stands on the site of a house occupied by Thomas Coutts, the banker, and built by Sir William Ashurst, Lord Mayor in 1693-4.

**A** WELL-ILLUSTRATED description of "Carmen Sylva's" new home in the Carpathians has been issued by a Vienna publisher. The Queen of Roumania's miniature "Sandringham," if we may call it that, took about ten years to build, and cost King Charles I. some six million francs, about 24,000*l.* Professor Doderer, of the Royal Technical College at Vienna, was architect, and he was assisted by the sculptor, Herr Martin Stoehr. The stately Herr Doderer adopted in the "German Renaissance" of the sixteenth century, materials used being national building stones and timber. The description of "Koenigschloss Pelesch" (under whose name the building is best known on the Continent) has been edited by the cura-

\* Views of the chapel are given in the *Envy Magazine*, October, 1800, *Mirror*, May, 1833, and *terior Gentleman's Magazine*, April, 1834.



of the Vienna Arts and Crafts Museum. Herr Von Falke. The pupils of the schools in connexion with the Museum furnished the illustrations (some twenty-five etchings and thirty woodcuts). Strange to say, the book does not contain a single plan of the building.

THE paper called the *Scientific American* whatever other science it may be deficient in, seems to be an adept in the useful science of filling its pages at other people's expense. In a recent number we find not only Mr. Brewer's drawing, "On No Man's Land" reproduced as an illustration to dignify its front page, but nearly the whole of our article on Westminster Abbey in the same number reprinted; all this without even asking if it were agreeable to us, or without any more ceremony than inserting "From the *Builder*" at the head. If American journals are under the impression that we are satisfied with this kind of compensation they are mistaken. Such articles and illustrations cost a good deal of our money, which is not expended to enable papers like the *Scientific American* to fill their pages with what we have paid for. In England has been settled, by a recent action of the *Times* against the *St. James's Gazette*, that mere acknowledgment of the source is no legal defence for copying another paper's matter wholesale. In the present state of copyright law between England and America we are unfortunately without legal redress, and have only left us the rather unsatisfactory compensation of telling the conductors of the *Scientific American* publicly that we regard them as no better than a set of literary thieves.

#### ROYAL INSTITUTE OF BRITISH ARCHITECTS:

##### LONDON STREETS AND BUILDINGS BILL.

The adjourned tenth general meeting of this Institute was held on Monday at 9, Conduit-street, Mr. J. Macvicar Anderson, the President, the chair.

The Secretary (Mr. W. H. White) announced the decease of Mr. Francis Markham Risbee, who died in Africa, and also of Mr. Samuel Hill, associates.

The President stated that an examination to qualify for candidature as Associate was held during the week ending March 5, when 93 candidates were examined, viz.—76 in London, in Glasgow, 8 in Manchester, and 4 in Bristol. The result of the examination was as follows:—

London 24 passed out of 76 examined; in Glasgow 4 passed out of 5; in Manchester 3 passed out of 8; and in Bristol 1 passed out of 4. The names of the successful candidates were as follows: Arthur John Pictor, Barnstaple; John Fairclough, Glasgow; George Smith Hill, Glasgow; James Lochhead, Glasgow; George Sutherland, Glasgow; Walter Hugh Barker, Wrexham; Leonard Harris Dutch, Rusholme; Thomas Henshaw, Halifax; Charles Cyril Absalom, London; John Anderson, Aberdeen, N.B.; Ralph Waldo Beesfield, Leicester; Anstey George Bewes, Plymouth; Eustace Godfrey, Toronto, Canada; Thomas Hardy Bishop, N.B.; Leighton Buzzard; Frederick Ernest Bates, Sunderland; Lewis Eric George Collins, London; Henry Walter Coussens, Hastings; Albert Andrew Easdale, Castleford, Yorks.; John Frederick Fogarty, Bournemouth; Solomon Bond, London; Arthur Henry Wharton Glasson, Glasgow; Arthur Troyte Griffith, B.A. Oxon.; Harry Harrington, London; Victor Daniel Horsburgh, Edinburgh; Louis Jacob, London; Arthur Hay Livingston Mackinnon, Aberdeen; Joseph Charlton Maxwell, North Shields; James W. John Phillips, Belfast; George Percy Pratt, London; Arthur Stedman, Gloucester; Northampton; Thomas Edward Nickpenny, jun., Bournemouth; Edward Tylee, London.

Mr. Edwin T. Hall then resumed the debate on the London Streets and Buildings Bill. He said that on the last occasion this was discussed

Dr. Longstaffe, the Chairman of the Building Committee, and of the Sub-Committee in charge of the Bill, and also by Mr. Bruce, the Chairman of the Housing Committee of the Council. They had some little difficulty in discussing it, because Dr. Longstaffe opened his speech by

telling them that the London County Council would probably give way and take their views in regard to a vast number of the detailed amendments suggested, but they had not yet reached the happy state when they agreed on some of the principles now existing in building legislation. The fact however remained that this Bill, as put into their hands, had been read a first time, and none of the suggested amendments that the sub-committee had discussed with the delegates of the Institute had yet been approved by the County Council, therefore it was possible they might disapprove of any amendments at all. The first observation he would like to make about the Bill was that it was a private one. But a very grave question of principle was involved in that, because it repealed no less than eight different Acts. Dr. Longstaffe was kind enough to refer to the view the Institute had put forward, that matters relating to building should be codified as well as matters relating to building. He would like to draw a distinction between those matters which were engineering and those which were medical. That never was their intention, and he had never suggested that there should be anything such as the codification of all sanitary laws in the broadest sense. Nor did they propose that all sanitary matters which related to the engineering branch should be brought into the Bill. He took the broad principle that it was wise that there should be a Bill which dealt with everything within a building and the pertinents thereof. It was impossible that he should deal with all the details of so complex a measure; but he would like to refer to one or two points which were worthy of grave consideration. The first referred to the District Surveyors. It would be noticed that under the present scheme it was proposed that the County Council should have the power, in fulfilment of what had been understood to be their policy, of making District Surveyors simply paid officials in the strict sense of the word. It had always been held by the Institute, and the opinion had been expressed in reply to the invitation from the County Council, that this was a grave error. The Institute had always held that District Surveyors should be architects, for the simple reason that they alone could be cognisant of all the complex troubles that architects had to deal with. If they really became ordinary officials in the same sense as the Sanitary Inspectors, their status would be lowered, and that in the face of the understood desire of the County Council that the status of the District Surveyors should be raised. On that detail there should be reconsideration on the part of the County Council. The next thing they came to was a question of graver principle. The first thing that should be considered should be the definitions, for unless they were agreed on these it was almost useless to discuss a Bill. There were many definitions wanting in the Bill; there was no definition of a shop in the Act, and when they came to think of the vast interests involved in shop-building in London it was a grave omission. Then, there was no mode of measuring cubic contents, and several other things; but he would draw attention to one or two of the definitions which did exist. There was that as to habitable and uninhabitable houses. It must be desirable that in any Act of Parliament dealing with buildings, the same definitions should run through all, but the definition in this Bill differed from the definition of habitable rooms in the Public Health Act, 1891. Further, the definition as drawn here made habitable rooms which were not so in the Public Health Act, and which would lead to confusion. Coming now to the graver principles to which he proposed to direct attention, he would first point to Clause 5 of Part I., a clause which dealt with the widening of streets. This stated that if anyone attempted to widen a street which was less than 40 ft. in width, it must be made 40 ft. or more, and the result of this would be to retard the sanitary widening of narrow streets. Clause 7 dealt with streets, and gave power to the County Council to insist on streets being not only what the present law was, of 40 ft. in width, but they might have power to order that streets should be 60 ft. wide. This was perfectly reasonable where the circumstances were as described there, and where it was possible that it might become the continuation of a great thoroughfare, it was right to have a street made wider. But a distinction should be drawn between the width of a street necessary for the development of the ground and the width of a street necessary in the public interests—the difference between those two things should be paid for as a public improvement. Then they had Clause 9, which was practically a re-enactment of Section 6 of the 1878 Act, but it omitted the vital part of the

Clause 6 contained in the proviso at the end, to secure to the man his present rights in the property. His rights were now to be taken away, and he had no compensation. It was proposed that no house should be built within the minimum of 20 ft. from the centre of the road, or in the case of widened streets 30 ft. He would like to draw attention to the definition of a new building. It was not only what was popularly understood as a new building, but if it were re-erected after a fire or through any other cause, and if one house were made into two, it would be a new building. If a private residence were converted into shops it would be a new building, and the proprietor would have to set his building back to 20 ft. from the centre of the road without receiving compensation. That, surely, could not be considered as right. No one doubted the *bona fides* of the Committee, but what he felt was that the Committee had not given sufficient thought to the Bill, or they would never have proposed any such condition as that in the case of the conversion of a private house a man was to be mulcted in a great deal of his property. Part 2, Section 15, dealt with corner buildings. It would be remembered that in 1890 the London County Council brought in what was called the London County Council General Powers Bill, dealing with corner sites. The Institute opposed them on what they considered a very confiscatory clause, and it was altered in Parliament. Supposing there was a large field at the back of a house facing a main street, and which it was proposed to develop into building land, what happened was that, if he complied with the law, a man must be the owner of 40 ft. of land in order to get a road from the main road, and he might set back the front of the building on the new road to 50 ft. Under the clause, two houses which had a frontage of 50 ft. on the main road, if pulled down, would be confiscated, because the superintending architect had the power to define the setting back of 50 ft., so that the man who previously had two frontages of 25 ft. each would lose that without compensation. There was great difficulty in understanding that clause if it was compared with Clause 13. In this sense he had always understood it was a matter of law that the County Council or any one else might proceed under any given section, while under Clause 13 they stated that they might give compensation for setting back a house, and under Clause 15 they gave no such compensation. That was a very grave fault in the Bill. To show how this setting back question would affect London, he might mention that there were no less than 32 miles of streets within the small area of the City of London which were less than 40 ft. in width, while the total length of the streets within the City was only 48 miles. They all knew how narrow many of the streets there were, and he thought it would not be an unfair calculation to say that the average setting-back of those streets at the rate of 5 ft. on the thirty-two miles of roads would entail a sacrifice of 1,680,000 feet of land in the City. He believed he would not be overestimating the value of the land if he put it at 5s. a ft., and that would mean that there would be sacrificed by private owners—and private owners did not mean only the owners of the land, but the lessees—a sum of 8,500,000l. under the operations of this clause. That would be the loss to the land value, but the loss to the owners of the building would be equivalent, or probably more, and he had put it down for the sake of argument at 11,500,000l. So that under the operations of that clause there would be a loss of 20,000,000l. to the private investors who owned the lands. Then they came to Part 4, which was the most serious of all the parts of the Bill, this being the clause which dealt with what was known as the 45° angle. It would be easily seen what a tremendous reduction this would cause in buildings. Mr. Bruce had stated that what prompted the clause was the Housing of the Working Classes Act, 1890, and Dr. Longstaffe was kind enough to say that he never anticipated that this clause in its crude form would be passed, but probably a light was dawning upon them, because they thought they might see their way to confine it to the houses of the working classes. That light which was dawning upon them was pointed out by him (the speaker) in a paper which he read in that room two years ago. He knew that Dr. Longstaffe and other gentlemen had had his recommendations before them and had read them, and it was a great pity, before they drafted the Bill, and had it read a first time, they had not considered the suggestions he had thrown out. Mr. Bruce told them that the origin of Part 4 was this Act, and he said with great force that the difficulty was that under part of that Act of 1890, when they condemned a district



as insanitary, a man was able to build in a way which gave less room than before. If Mr. Bruce wished to confine that to the people in whom he was interested, there were none in that room who desired the working classes should live in insanitary buildings, or to assist the jerry-builder to evade the Act; therefore, that part might possibly be dealt with. But the Bill, as it had been read in the House, dealt with every building in London, and he would just venture to suggest a few buildings to the notice of the County Council. They probably knew the Grosvenor Hotel at Victoria. That building covered the whole area which belonged to the hotel, without back-yards or court. What, then, would be the effect of this angle of 45°, drawn from the ground-level at the back of the Grosvenor Hotel? Why, it would take off about two-thirds of the whole building, and that alone, he thought, would condemn any legislation of the sort. Then, again, there was Praed-street: on the site opposite the Great Western Hotel was a strip of land between Praed-street and the Underground Railway, and there were erected a whole length of four-story houses. Under the operations of the clause it would not be possible to build anything on that strip, because it was necessary to have a clear width of 10 ft. from the back before it could be built on, and it destroyed the whole of the property, which could not for a moment be considered as insanitary. It was a strip with ventilation, the whole being lighted from the front. Then there was the case of Queen Anne's Gate. The houses just within the Gate at St. James's Park were old houses, and would shortly be rebuilt, but if this clause were brought into play the effect would be that one of the finest sites in London could never be improved from its present, so to speak, squalid condition. Another example he might take was Southsea House, in Threadneedle-street, a building well ventilated and lighted, which, under the provisions of this clause, would lose about half its value. Another instance was the block of buildings called Great Winchester-street-buildings, facing four streets. It might be asked which was the back of this block. When it was built Great Winchester-street was the important street, but now he supposed London Wall was the more important. Had the superintending architect to define this, he would have probably said that London Wall was the back, and they should have found this fine building cut to pieces. Another thing he would like to draw attention to was the condition which stated that no building shall be built higher than an angle of 45 degrees from the opposite side. Under the present law, any new street was subject to that condition, but if it was applied to all the streets throughout London the result would be simply disastrous. But the strange thing was that, while under one clause they gave the height, under clause 55 they took it away, because they said that no building should be inhabited which was below an angle of 45 degrees measured from the building opposite. They had been told it was necessary for the sanitation of London to have all these alterations, but the peculiar feature was that everyone could get out of them by paying a fine. By having drawings made of their buildings by the District Surveyor they could rebuild at the same height as at present, which was a most ridiculous provision. By paying the fees of the District Surveyor, which he supposed would be something like five or ten guineas per house, they could get out of the difficulty. Now, the City of London contained some 11,000 houses, and assuming that a charge of ten guineas was made for making a survey of each individual house, they would have to pay a fine of, say, 110,000£, to retain that which was their own. What, then, became of the principle which stated that it was done essentially for sanitation? Dr. Longstaffe regretted very much that the Institute had not given advice and suggestions in regard to art, but the very reason for that was that they wished to be unrestricted. If once they proposed regulations in regard to the art of their buildings, they would find they had opened the way to restrictions which would absolutely destroy the artistic value of London. He had been delighted to learn that the Building Act Committee were concerned with the art of London, and were desirous to help architects, but there was only one suggestion Dr. Longstaffe had made, and that was in regard to the roofs. He said it would be desirable to get rid of the unsightly party-wall going through the roof, and he added that many towns in the north of England had this power. That struck the delegates as a matter deserving of consideration, and he had made it his business to endeavour to learn the

feeling of the great fire insurance companies of London. Through the kindness of his friend, Mr. Cousins Smith, he got the views expressed at a meeting of officers of the principal offices, and they said emphatically that they were unanimously against any such proposition, that it would vastly increase the fire risks, and that the premiums would also be increased. He thought, therefore, that would settle the whole question. The Institute suggested to the County Council that in regard to large warehouses the party-walls should be carried 3 ft. above the roof instead of 15 in. The County Council proposed 2 ft., but they thought that inadequate. Lastly, he would draw attention to the by-laws. Mr. Cates in his opening paper laid stress on the fact that under this Bill the County Council had power to make by-laws on all kinds of questions. It would be in their interest that the by-laws should be practical, because in the case of this Institute they had no private interest to serve, and, therefore, the County Council should not have the power they asked for of making by-laws to suit themselves without there being any controlling authority. The machinery should be the same as that adopted by the Board of Trade, which was that an Inspector should hold an inquiry to consider the suggestions and objections, and that then the matter should be dealt with. The only further remark he had to make was that private rights should give way to public rights, but with the essential condition that the public should pay for the private property taken away. Voltaire prayed that a statesman might come to rebuild and beautify his Paris. He asked for a statesman, a man with the power and wealth of the State at his back, and that aspiration was fulfilled. That was the only way in which London should be beautified and improved, and not that the private individual should be robbed of what might be his only property. He could not help feeling in reading the Bill that it was a Bill drawn up almost as if it were a specification for a hospital. It might be sanitary, but it would reduce the houses of London to about the same size as they were in the days of Queen Elizabeth. London was not a sanatorium, but the centre of energetic life, which was at the head of the art and sciences and of all the progressive affairs of the kingdom, and, therefore, it was that such legislation as was now proposed required the most careful consideration.

Mr. Taverer Perry said that the lucid description of the Bill given by Mr. Cates left little to be desired or added. Nevertheless, one or two of his objections required to be referred to, and one of the provisions with which he agreed ought to be protested against by every member of the profession. Those in active practice frequently had to do with a class of property used for the purpose of trade or manufacture, as well as with buildings of a more or less exceptional character, and they felt the difficulties and uncertainties of their position were considerably enhanced by the difference of opinion existing between architects. District Surveyors, and others as to the meaning of the present Act. But what were those troubles compared to the fresh ones looming before them? The monstrous shaving clause might be left to the great ground landlords to fight, but the provisions relating to streets and cubical contents they must see to. He might mention two classes of buildings which would be seriously affected by these clauses, which were neither exceptional in character, nor few as a class, yet he ventured to say, were the Bill passed intact, they would become almost impossible. He referred to large retail drapery establishments and hotels. In the first class he would instance a building which already covered 18,000 square feet, where the basement, ground, and first floor stories formed the shops, with no walls, party or otherwise, dividing the premises, whilst the main building rose to a height exceeding the proposed new limit. What would be the effect on this building of the proposed Bill, and what might be the effect should some application of the shaving clause convert it into a new building? The property for all purposes would be reduced in value more than one-half. Then there was the limitation of the height of the shop frontages, which would make such shops as might be seen in the Leipziger Strasse in Berlin impossible. In the second class of building he would instance a hotel covering more than two acres, abutting on three thoroughfares, and of great height. What would happen should the angle of 45 deg. be applied to such a place? The law of easements was sufficient to keep down the height of buildings. They were all agreed in wishing for a consolidation of the Building Act, and he would be glad if Mr. Cates's proposal could be

adopted, with a few variations on the lines he had suggested. He would mention for the consideration of the Council, that not only the proposition for a limitation of the height should be withdrawn, but that a strong protest should be made, at least that the question of the height should be left to be dealt with by the precedents under which they were too frequently restrained. Secondly, instead of limiting the cubical contents of the building used for retail trade, or where the broke goods in bulk, it should be sufficient to require that the portion used for residential purposes should be divided from the business portion by fire-resisting floors, in cases where the ordinary cubical contents were exposed. Where warehouses were built on the terrace principle, they were to a great extent more or less sky-lighted, and as in the case of the fire at St. Mary Axe, it was through these skylights that the fire spread. Had those buildings been of greater capacity, not one tithe of the mischief would have been done. The terrace plan was worthless for sanitary building, as roofs and flats were the parts less often cleansed, as the multiplication of leads, gutters and pipes under the back windows was likely to be more hurtful than the absence of a draught or two in the court-yard. The matter of the angle of 45 deg. or any angle seemed almost too foolish to discuss, and even were it fixed at 90 deg. he would not care to argue the question in Court for fear of consequences. The object of reserving air space in the rear of a building was good, but might be done in a more reasonable way by adopting the course pursued in Berlin in building a portion of the city, where, a sufficient large courtyard, abutting on the adjoining premises being left, the whole building might be carried to its full height. In conclusion, he would impress upon the Council of the Institute that they should take care that their increasing numbers should not discover until too late that the last place in which an architect should practice his profession was the metropolis.

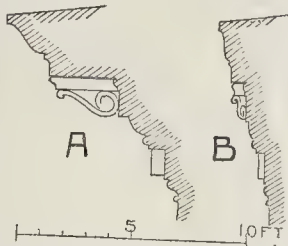
Mr. J. J. Stevenson said that Mr. Cates had stated that in the width of the roadway a space not exceeding 5 ft. should be left between the footway and the external wall of the house. That it was said, would be an admirable thing, as it would prevent the miserable practice of building houses close up to the edge of the footway. Had that provision been insisted on during the last few centuries, however, they would have had neither Oxford nor Cambridge, which were usually supposed to contain our best architecture. The charming characteristic of Oxford and Cambridge was that the colleges rose straight up from the footway, without any space between them. Longstaffe, at the last meeting, had told them how the Bill was framed. The subject, he said, was grappled with by a committee, who were always present, nor were they the same every time, and a committee which lost patience, to say the least. Then, after the committee had made up their minds, the Parliamentary draughtsman was called in, who had little time to do work, and who did not understand the technicalities of the Bill. That, in his opinion, was the way to draw a Bill which might confiscate property amounting to millions, and this might account for a result which was in many points unsatisfactory, not to say absurd. They knew the difficulties of the Building Acts, but architects were as anxious as the members of the County Council to have good building and sanitation, and they had more knowledge of what provisions would be necessary. But he would ask, did not this tend to hamper architectural design and encourage useless waste? Why should there be a frank association with architects, on the part of the County Council, to attain the results which both desired, instead of assuming that architects wanted bad building and fighting before a Parliamentary Committee with results which would probably be unsatisfactory to both and enormous cost? In many respects the Bill was an improvement on the old Acts, but it left much to be desired. It would make impossible in many situations the building of the best London houses of which he might claim to have had some experience in the last twenty years. There was quite royal indifference to cost and a waste of property in the bill, with a certain liberty of treatment of important matters. For instance, there was the diagonal line in clause 30, which would make the design of a house pyramidal in form. The Pyramids, no doubt, were excellent in that way, but they were not at all suitable for dwelling houses. He presumed this was done for the sake of air and light, but the open space at back, if sufficient for air at the ground level, would be more than enough. Architects knew



difficulties of getting light into every part of a deep London house, and for every case there must be a different expedient. The idea of one rule for the purpose of every different case was preposterous, while the cost of enforcing it would be incalculable. Why should a house in a street be no higher than its width? It was not necessary for health, and it did not add to the beauty of the streets, though an inordinate height was decidedly an evil. In truth, what ruined the architectural interest of modern towns was the universal pressure of building acts, reducing all the houses to a dreary, monotonous, dead level of uniformity. As to sanitation, it was an advancing science, but, somehow or other, sanitary experts seemed to have inherited the old persecuting spirit of the theologians. They wished to compel people to believe in their tenets by fine and imprisonment. Mr. Wallace Bruce, in his remarks at the last meeting, pointed out the discrepancies between the requirements of the Workmen's Building Acts, 1890 and 1891, but if the County Council chose to adopt costly and objectionable requirements for their own buildings, that was not a good reason why they should force them on other people in cases where they did not properly apply. He was glad to see that they were disposed to consider further the possibility of different requirements for varying conditions and kinds of buildings. The interest was enormous for cost, for health, and for art, that he was sure the County Council would not allow their own power and dignity, or even the desire to pass the Bill at once, to stand in the way of its being not only efficient but reasonable and just.

Mr. H. H. Statham had been very much struck with the great respect for private property which had been evinced in most of the speeches made by the Bill. As he listened to Mr. Cates's speech, as well as to other speakers on the subject, he could not help thinking of Emerson's "Northern Farmer—new style," who had the sound of his horse's hoofs going to the words "Property, property, property." It seemed, they were going to have a Bill which was to assist in the improvement of London from a public point of view, they really could not expect that private interests ought to stand in the way to such an extent as had been contemplated by some of the speakers. It appeared that their friend from Glasgow had really hit the nail on the head on the Monday preceding, when he said that what was wanted in the Bill was a clause for compensation. There were a great many provisions which involved the taking of private property, but there was nothing in it providing that the proprietors were to be compensated. That bore on one point which he wished to draw attention, viz., as to the specified widths of streets which were to be permitted. Forty feet was to be the general thing, and the Council thought that the street might become very important main avenue they would have the right of requiring that it should be 60 ft. Now, he had been testing the widths of some of the streets as object lessons. He found that the average width represented by Chancery-lane was at a 40 ft. street. Was that what they ought to contemplate as the average width for the London street of the future, or even for the streets which were not main thoroughfares? Long Acre, again, was 50 ft. wide. The street in which he lived—Gower-street—was 60 ft. wide, and, in spite of his natural predilection in favour of it, was afraid he could not define it as a first-class street. Oxford-street (at the east end) was 60 ft. wide, and these represented apparently the widest streets the County Council were contemplating to allow for the future. He considered that was miserable. One of the greatest differences noticeable when one left London and went to Paris was the superior width of the streets. The only street in London at all comparable to the best streets in Paris was Portland-place, and that was because, he believed, the owner of the house there the Langham Hotel now stood had a condition in his deed of sale that no buildings should be erected to the north of it, and therefore the street had to be made the width of his property. The widest part of Holborn was 115 ft., which was not at all too wide for the traffic that was always choking it. That was one point which the County Council ought to have brought before them—viz., that they should not tie themselves down, width, or, if they wished to tie themselves down, they might say it should be 60 ft. for the average street and 100 ft. for the others. He wished to refer to another point. Dr. Longstaffe, in his very speech at the last meeting, complained that he had had no suggestions from the Art Committee on questions of art. He now proposed to offer

Dr. Longstaffe "a suggestion." Dr. Longstaffe specially spoke with great approval of the limitation of the cornices, and he laid down that they should not be of more than 2 ft. projection. Now, the present was a time when there was a great revival of interest in Classic and Renaissance architecture. (Mr. B. Dicksee: "It is 2 ft. 6 in. in the Bill.") Very well, 2 ft. 6 in. was just the same for his purpose. He had been looking at various samples of Renaissance palaces, and he found that the Riccardi Palace had a cornice of 9 ft. projection, the Strozzi Palace had a cornice of nearly 8 ft. projection, the Guadagni Palace one of 7 ft. The Pitti Palace had one of 2 ft. 6 in., and Fergusson made a lament and regretted that they had half ruined the building by its wretched cornice. He had put a section of the Strozzi cornice on paper, one fourth



A: Section of Cornice of Strozzi Palace.  
B: Strozzi Cornice as it would be when subject to the restriction proposed in the new Act.

the actual size, marked A, and the Section B showed what it would come to under the proposed restriction. He did not say that they should emulate such cornices as a rule, but if they were to practice architecture more in a Classical form they could not afford to have merely a 2 ft. 6 in. cornice on a grand monumental building. He would suggest either that that limitation should be widened, or else that there should be a clause to allow the Council to make exceptions where desirable; at all events they should not tie themselves down so that any sort of monumental building should have a cornice that would be insignificant.

Mr. Roberts said that, as a member of the much-abused Committee of the County Council, he would like to say a word. He was pleased to hear Mr. Cates's paper, he being the Chairman of the Appeal Tribunal of the Council, and having done much service to London in that capacity. With regard to the frontages, he was glad to hear Mr. Statham's remarks. In listening to the debate he recognised the word "property" freely mentioned, and such words as "confiscatory," "monstrous," "spoliation," and other terms that they did not usually associate with the discussions of professional and architectural societies. There was something to be said on the question of property, but that was not a matter for discussion there. They were asking the architects and surveyors to give their suggestions as to the merits of the Bill. He understood from Mr. Cates that he approved the application of the clause with regard to the width of streets and back-courts with regard to new districts, but he objected to them with reference to old districts, simply on the ground of vested interest. Therefore, according to that contention, the Council had put forward an ideal Bill in respect to new buildings, but with regard to old buildings they ought to consider vested interests. When a man set out his new building estate he had to provide certain roads and thoroughfares of a certain width for the right of building. He would go further and say that when, in the course of time, what he should call the building rights of the land were exhausted, and rebuilding took place, the roads and thoroughfares should be widened, in accord with the conditions of the time, and at the expense of the owners of the property. That principle had been carried out with regard to sanitary questions, and a man would not be allowed to rebuild his house in London and put in the sanitary appliances he would have been allowed to use sixty years ago. So far, then, there had been interference with vested rights, and it was really a question of degree. If the owners of building property had so far pursued their building rights as to render certain parts of London uninhabitable and insanitary, those owners should be made to render back what they had no right to have. That was the opinion of many of them with regard to the future of

building in London. He did not consider the narrow thoroughfares referred to in London were sanitary, and they admitted it by saying that these proposals were good for the future, though not good for the past. It had been suggested that they should confine their Act to dwellings for the working classes. It was very doubtful how far they should legislate in London for one class alone, and they did not think that the inhabitants of Mayfair had any more right to dwell in insanitary buildings than the inhabitants of Whitechapel had.

Mr. Stevenson: It is not different classes of people, but different classes of building.

Mr. Roberts said it was a very difficult question, but it might lead to a great improvement in London dwellings, and to a revival in building of a higher standard than had maintained in the past. In reference to the subject of width of roadways, he remembered a paper being read by Mr. Slater two or three years ago at this Society, which struck many of them at the time as being exceedingly able. In that paper he mentioned that in some of the wealthiest and most fashionable suburbs they found streets containing highly rented houses which were the abomination of dulness on account of the narrowness of the roadway. Now, the Council wanted to prevent that in the future, and when London was rebuilt that condition of affairs should not come forward again. He hoped the architects and surveyors would help the County Council. He believed there was a strong tide of feeling outside on the matter, and that London was waking up to the fact that it was a great city, though badly built; that it was by no means the most desirable city to dwell in; and that it was high time that some reforms should be made. Birmingham had done much in that way, but London had done very little during the present century. The Council thought they had set a high standard, and they hoped that many architects would sympathise with their views and not look upon them as opponents.

Professor Banister Fletcher would like to remind the last speaker, when he was comparing the present state of London with what it was twenty or thirty years ago, that the London of to-day had advanced enormously in the width of its streets and thoroughfares. Mr. Roberts had spoken of the crowding of houses, but he would like to remind him that St. Giles's had almost disappeared through the action of the late Metropolitan Board of Works, and he need only mention other improvements such as the Thames Embankment, Cannon-street, and Queen Victoria-street, to illustrate what that body had done. Then if he wished to instance what private individuals had accomplished, he might take Grosvenor-place, and the enormous improvement in that quarter. If London was so unhealthy as had been stated, it must have been far more so a few years ago. There was no question that the builder was entitled to make the most of the land, and why should they always run at the poor builder because he was only following his trade? With regard to exceptional legislation for the working classes, he thought that any legislation which dealt with any class must be manifestly wrong, and he would, therefore, strongly urge that this Bill should contain no separate legislation for the working classes. As to the width of the streets, he believed that the old Metropolitan Board, after much inquiry, decided that 60 ft. was the best width for traffic, and that it was better to have two 40 ft. roads rather than one road of a very wide character. He agreed with Mr. Statham that a road of 120 ft. in width gave greater grandeur to a city, but for the working of the traffic 60 ft. was recognised as a proper width. With regard to the limitation to be gained by actions in light and air, he believed these cases might sometimes be settled by monetary payment, and where metallic payment was made the owner might go up to any height he liked. He believed it was intended that all lifts should be enclosed, but he thought some alteration was requisite there, and that certainly those lifts which were by an open staircase might be exempted. They were very valuable accessories, and could not be so placed if they were to be enclosed, while, if enclosed, they were really funnels through which the fire would rush up in case of a conflagration. With regard to the line of angle, the objection to any angle was that it must of necessity make the buildings internally worse. They would not be able to get a square room, and any angle should cease when it touched the back wall. The County Council had been doing some good work with regard to drainage and ventilation, and it would be well if they



would test the air in some of the narrow courts at the East End of London, also in the West End, and various other places, and so find out whether the air was of the vitiated character alluded to, and whether the cutting off of the angle would be of great advantage in the lower portion of the building. There was one thing he intensely disliked in the Bill, and that was the word "permit." The whole Bill was permeated with permission to avoid. There was no Act in existence, he believed, which so thoroughly depended upon sweet will and pleasure as this one of the County Council, and, in saying this, he wished to guard them against all those temptations which must arise if the Bill became law.

Mr. J. R. Williams said that one speaker had referred to the cornices, and said that by the Bill they could not have a cornice more than 2 ft. 6 in., but if they had a very large cornice on one side of a narrow street, and another on the opposite building, they would pretty well meet in the middle. Professor Fletcher had spoken of St. Giles's, and said it was a very different place to what it used to be, but for the last ten years he found that the district of South St. Giles had a death-rate of 35 per 1,000. He had taken specimens of air in some of the courts and streets, and he found the air in the streets and crowded courts very far from what the normal air of London was. Inside some of these places he found the air to have '9 of carbonic acid per 1,000 volumes, which was a great deal more than the sewers were found to contain; in fact, some of these houses were less healthy than the sewers. It was said that the Grosvenor Hotel had no back-yard or courts, but what architect could have designed such a building? The Bill was acknowledged to be defective, and its authors wished assistance, but the principle of it was good. Should the building laws protect the interests of land owners and professional men, or should the first consideration be for the users of the buildings themselves? (A voice: "Both.") The speaker then went on to quote extracts from medical officers' report.

Professor Kerr remarked that the discussion seemed to have turned almost entirely hitherto upon Part 1 and Part 4 of the Bill, viz., the sanitary question. Upon that he would simply say that he was fully in accord with what had been stated by Mr. Roberts and others with regard to the improvement of London, if it could be effected. The difficulty was to find out how anything could be done to improve more particularly the old parts. With regard to the new parts he felt no mercy for the landowners, for they were creating ground rents out of nothing, and they might well give up land for the public benefit. But, as a District Surveyor, he would make a remark on what he regarded as the practical merits of the Bill. He thought, in the first place, that the Building Act Committee had overlaid themselves tremendously with work, and it was perfectly impossible for them to do all that they had set out in this Bill. The Professor then read a long list of the duties they proposed to undertake, adding that they had to deal besides with 27 specified offences, and with 50 and 50 a day. Throughout the Bill they had to deal with conditions of their own making, and with the recovery of money claims and the general enforcement of all these against the public. It was a bill that was a course of law, in these courts would resist them instinctively to the utmost. Those who were acquainted with building contests in the courts of law knew that the lawyer would not side with the architect if he could help it. The settlement of this new law would take from eighteen to twenty years of litigation to accomplish, and the amount of dragging which they had incorporated in the provisions of the Act, was greater than he had experience of before. He had made a great many notes on the Bill itself, and he would like to mention a few of them. On page 3 he had made a note as to the delay in obtaining any decision of the County Council on questions. It took six weeks to get an answer to any application. Under the Metropolitan Board it took a month, but now 50 per cent. had been added to the time, though Dr. Longstaffe stated that the fault did not lie with Spring Gardens, but with the vestries. On page 6 he had made a note with regard to the question of compensation. It should be borne in mind that, when on new ground a building was set back the loss of land was a loss of back land, because they were shifting back the whole of the structure. The compensation must go on the value of that land, and, *per contra*, there must be set off the advantage of the wider street, and he was much mistaken if the one would not cover the other.

The intention of the County Council no one could deny to be sound. It had somewhat of a Radical turn of mind, as they could see. No doubt their motives were excellent, but they did not seem to have been fully informed of the difficulties that District Surveyors knew were constantly occurring in respect of the administration of the law. The courts of law were against them on every occasion. (A voice: "No.") He did not know how many cases the gentleman had won, but that was his impression. If this Bill was passed with all the dragging in it now contained, anyone would know that the Law Courts would assist the public in passive resistance to everything bearing the appearance of oppression, and quite right too. On page 11 he had noted that the judicial proceedings of the Building Act Committee, which sat in private, and was not unfrequently called a Star Chamber, ought to be authorised specifically by the Board. The great complaint he found made by the public was with regard to the Building Act Committee, and they were continually saying, "For God's sake, don't send us to the Building Act Committee; tell us what you want; anything you order we will do, but don't send us to Spring Gardens." It might be well to delegate a great deal of the work done by the Committee to District Surveyors. District Surveyors were qualified men, and they might relieve the County Council of a very large proportion of the work which he was sure they would never be able to do. On page 15 there was a very curious thing. He found the angle of 45 deg. was described in the most unscientific phraseology possible to devise. A line was length without breadth, and they would see that a diagonal line had no value in determining what should be done. The gentleman who drew this, he supposed was a lawyer, and did not know the difference between a line and a plane. It seemed to him that to have a 9 in. wall 30 ft. long and 20 ft. high, and half cut into with recesses and openings was such bad building that he did not think any such walls should be allowed, except, perhaps, on the top story. On page 23 he had this note: Structural ironwork ought to be brought under supervision somewhere or other. By the Act of 1855 the word "chimneys" had several meanings. It meant chimney openings, chimney places, chimney stacks, chimney shafts, and chimney pots, and there was no attempt made to correct that absurd view. The term "low pressure," applied to heating pipes, ought to be defined. He had never been able to discover that low pressure had any meaning at all. On page 48 he had made the following note: Can anything be done to throw the expense of rebuilding party walls upon the owners of the properties instead of on the unfortunate tenants? Then, again, tenants should be relieved from rebuilding dangerous structures. That was a very extraordinary clause, and as a District Surveyor, he would appeal to the Institute as a protecting body. Clause 135 stated that every District Surveyor should forthwith notify to the Council any actual or probable contravention of the provisions, &c. In this case the District Surveyor had to be a common clockmaker. The refusal of appeal would be an exceedingly costly affair, and its proceedings would be expensive from beginning to end. The way of measuring the thickness of walls in a garbouse was fantastic and foolish. Why could not they devise some means of going story by story and height by height? With reference to fire-preventing, that was an interesting subject, and if, as was stated to be the case, most buildings could be made fireproof at an extra cost of 5 per cent., now was the time to improve upon the buildings of London in that respect. As to the District Surveyor's remuneration, that was a delicate subject, but he would say that he regarded the proposed twopenny-halfpenny system as one which no gentleman could be expected to submit to. They were to be paid by shillings and sixpences just as if they kept a chandler's shop in a back street, and this mode of charging was unknown in the profession. They ought to be paid according to their attendance, as at present, and not by sixpences and half-crowns. How the County Council could say that they desired to raise the status of the District Surveyor, and, at the same time, offer him this wage, he could not understand. Then, again, the District Surveyors were to be charged with a great deal of extra work, for which no remuneration was offered, just as if they were the day labourers of the County Council, to be paid whatever they pleased. It should be remembered that District Surveyors were under a contract, which ought to be fairly carried out.

Mr. Collins said he had already expressed his

views at a kindred institution, but he rose for two reasons. He did not think, in the first place, that any of them had expressed sufficient gratitude to Mr. Cates for the trouble he had taken in the matter; and, secondly, he could not help seeing there was a great deal of justice in Mr. Bruce's contention when he pointed out the anomaly between the Bill for the Housing of the Working Classes and the Bill of 1855. He did not quite go with Mr. Hall. They must make no distinctions of class, and it must be quite as correct the dweller in Bethnal Green to have the same conditions surrounding him as the person who lived in Mayfair.

Mr. William Woodward asked what were the circumstances under which the delegates went to the London County Council prior to this discussion, when it had been determined at a meeting of the Institute that the discussion should take place first.

The President said he was quite ignorant of any idea that the delegates were not to visit the County Council until the discussion had taken place.

Mr. Marsland (Deputy-Chairman of the London County Council Building Sub-Committee) remarked that, up to the present time, the Committee had not come to any determination on the points under discussion of the delegates. They hoped, however, in the course of the next week or two, to come to a decision in the matter, and then they would have great pleasure in circulating the result among the members of this and other kindred bodies. They were extremely glad of the assistance they had received, and hoped it would be for the benefit of London generally. They did not wish to be pragmatical, and say that their ideas were the only ones which should be recognised; their object was to obtain a good system of building for London, with regard to its sanitary arrangements, its fire-resisting properties, and also for the proper arrangement of streets and roads, and they were only too pleased to have the assistance of such bodies as the Institute to aid them.

Mr. E. Woodthorpe seconded the vote of thanks to Mr. Cates. He believed that everyone present would agree that the angle would be excellent if it was possible, but in a great many parts, and particularly in the City, he feared, proceeded with, it would defeat its own end, defeated altogether, would not the County Council lose the chance of doing an immense amount of good? Separate sets of offices were not considered in the Bill. The people who put them did not know how they were to be occupied, they could not divide them by party-walls. The buildings should be legislated for, and have fireproof walls and staircases throughout.

Mr. Caröe, referring to the matter of party walls, regretted that Mr. Hall had gone to the fire insurance companies, and asked their views on the subject. What the ought to have inquired was whether any instance existed of a fire spreading in any town where the party-wall of the parapet was not carried through the roof.

Mr. Dicksee thought that any restriction tending to lessen the window-space would be disadvantageous, but that would be the tendency of the Bill.

The President, in closing the discussion, said they were all agreed, he believed, in thinking that the London County Council were actually with the very best possible motives in drafting their Bill. At the same time, it did not follow that the best possible motives conducted to the best possible results, and he had no doubt that the very exhaustive debate they had now concluded would have the effect of throwing considerable light upon a very complicated subject.

The vote of thanks to Mr. Cates was then passed by acclamation, and the proceedings terminated.

#### THE LONDON COUNTY COUNCIL.

A SPECIAL meeting of the London County Council was held on Friday last at the Court Hall, Spring Gardens, Mr. John Hutton, Chairman, presiding.

The greater part of the sitting was occupied with the consideration of the recommendations of the Special Committee on London Government, which, after a great deal of discussion, was agreed to.

Lee Bridge.—The Bridges Committee recommended:

(a) That, subject to an estimate being submitted to the Council by the Finance Committee, and required by the statute, Lee Bridge be rebuilt at an estimated cost of 10,000*l.*, on condition that



Essex County Council contribute 4,250*l.*, the Lee Conservancy Board 500*l.*, and the Leyton and Walthamstow Tramways Company 1,000*l.* towards the cost.

(b) That, subject to an estimate being submitted to the Council by the Finance Committee as required by the statute, the engineer be instructed to make two borings to ascertain the strength and depth of the existing foundations of the abutments and wing walls of the bridge at an estimated cost of 500*l.*, and that the work be carried out by the Works Committee.

After a brief discussion the recommendations were agreed to. The usual weekly meeting was held on Tuesday, Mr. John Hutton presiding.

**Vauxhall and Lambeth Bridges.** The adjourned report of the Bridges Committee related to Vauxhall and Lambeth Bridges, and was as follows:—

We have considered what means of transit across the Thames should be included in the Council's Improvements Bill to be introduced into Parliament during the session of 1895. There appear to us to be several schemes of pressing importance. But the most urgent are those for the reconstruction of Vauxhall and Lambeth bridges. The consideration of these two crossings cannot very well be separated. The question which has engaged our attention is whether one of these two bridges should be constructed before the other, and if so, which, or whether it would be expedient to obtain powers for the reconstruction of both bridges in the same session of Parliament. Viewed as a public improvement, whether with reference to the road traffic or to that upon the river, in our opinion there can be no doubt that Vauxhall Bridge claims the more immediate attention. The reconstruction of this bridge involves no extensive system of street improvements, no opposition is likely to be encountered, nor would it necessitate any further expenditure for the approaches to render it at once and for all time of advantage to the public. The width of 80 ft. having been decided upon, the reconstruction of the bridge would at once place two important railway stations, Vauxhall and Victoria, in immediate communication by tramway, which in itself would, we think, be of considerable public importance. With regard to the traffic over Lambeth and Vauxhall Bridges, we find that in July, 1891, the maximum for Lambeth Bridge varied from 118 to 130 vehicles per hour, whereas for Vauxhall Bridge the maximum varied from 220 to 242 per hour, and on comparing the traffic over Vauxhall Bridge with that taken in 1880 at Norfolk-street, Strand, it appears that the traffic over the bridge amounts to about 64 per cent. of that passing along the Strand. Taking the above figures, we may say that as regards traffic Lambeth Bridge is to Vauxhall Bridge in the proportion of about 1 to 7, and certainly, if we say that the Lambeth Bridge accommodates not more than one-sixth of the traffic which passes over Vauxhall, we shall be within the truth. Looking at the direction of the principal thoroughfares on both sides of the river leading to and from Vauxhall, Lambeth, and Westminster Bridges, it appears to us that this disparity of traffic is likely to continue until some new line of approach is made from St. George's-circus over Lambeth Bridge in the direction of Victoria-street or the Victoria Station. The cost of a new bridge at Vauxhall, 80 ft. wide with gradients of 1 in 40, would be 380,000*l.*, including 30,000*l.* for a temporary bridge, and the property charges are estimated by the value at 74,000*l.*. The latter will be incurred entirely on the south side of the river in respect of property opposite the gas-works. Lambeth Bridge, with a width of 80 ft. and gradients of 1 in 30, would cost 185,000*l.*, to rebuild, inclusive of 30,000*l.* for a temporary structure, and if the property to be acquired be limited to that necessary for widening the approach roads to 60 ft., with gradients of 1 in 30, its estimated cost as given by the value would be 95,000*l.* net, so that we get the following figures comparatively for the two bridges:—

Total cost of Lambeth Bridge.....	£481,100
Total cost of Vauxhall Bridge.....	454,000

A difference in favour of Vauxhall Bridge.....	£27,100
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But this does not fully represent all the circumstances of the case. The above expenditure on Vauxhall Bridge would create at once an important public improvement, while the larger expenditure on Lambeth Bridge would require to be supplemented in the future by some very extensive and costly widenings, embracing Millbank-street, Horseferry-road, with a new street in addition thereto, and also Church-street, Lambeth; until these improvements were effected it could not be said that the public would reap the full benefit of the widened bridge. The cost of these widenings would probably amount to something like the cost of the bridge. We think it advisable to inform the Council of the present stability of the two bridges. The superstructure of Vauxhall Bridge would in all probability remain safe for many years provided the foundations remained intact. It is in its foundations that the bridge is weak. These were

strongly reported against by Sir Frederick Bramwell and Sir Joseph Bazalgette some years ago, and since then the foundations of the piers have been protected by blocks of iron slag. The piers have recently been examined by a diver, who found that some of the deposited slag had been removed, but not to such an extent as to expose the timber, and we are now waiting for soundings to be taken above and below the bridge before reporting in further detail to the Council. The scour through the arches of the bridge must inevitably in course of time undermine the piers, and the whole structure will then be liable to subsidence. We do not, however, apprehend that there will be any sudden collapse of the bridge, as it is anticipated that warning of impending failure would be given; at the same time we think that the rebuilding of the bridge should not be much longer postponed. As regards Lambeth Bridge, it was undoubtedly in a shaky condition at the time it was taken over by the late Board, but the alterations and improvements subsequently carried out have, we are advised, placed it beyond the risk of immediate failure, especially as the weight of loads allowed to pass over it is restricted. We must, however, express our opinion that the bridge should be reconstructed at an early date. Upon a review of all the circumstances, we have come to the conclusion that Vauxhall Bridge should be rebuilt as soon as possible, and we therefore recommend:—

(a) That the Council do apply to Parliament for power to rebuild Vauxhall Bridge at an estimated cost of 454,000*l.*, including 30,000*l.* for a temporary timber bridge, 50 ft. wide, to cross from the western end of the Albert Embankment to Millbank. (b) That the Parliamentary Committee, to be set up by the Bridges Committee, be instructed to prepare a Bill to be introduced in the session of Parliament for 1895 authorising the rebuilding of Vauxhall Bridge.

Lieutenant-Colonel Ford moved the following amendment:—

"That, as under the present system of local taxation the whole of the large cost of rebuilding Vauxhall Bridge would fall upon the occupying ratepayers, the Council of the City and County of London, if the County and local rates, does not deem it expedient to apply to Parliament for power to rebuild the bridge until provision has been made for the owners of ground values to bear a fair proportion of the cost."

Alderman Fleming Williams seconded the amendment.

After further discussion the amendment was lost on a show of hands, and the Council divided. The figures were, for the amendment, 39; against 59. The recommendations of the committee were afterwards agreed to.

**The Council and the Water Companies.** The Water Committee reported that they had communicated with all the Metropolitan Water Companies with regard to entering into negotiations for the purchase of the Companies' undertakings. They had received simple acknowledgments from the Lambeth and New River Water Companies, but three other Companies, viz., the Grand Junction, the Southwark and Vauxhall, and the East London, had returned specific answers. The Grand Junction Company state that they were not willing to enter into negotiations at the present moment for the sale of their undertaking to the Council. The Southwark and Vauxhall Company say that they had no intention or desire whatever to sell their undertaking, and the East London Company do not see their way to enter into negotiations for sale on the basis indicated in the resolution, but they added that if any definite and practicable proposals were made for the purchase of their undertaking they would be prepared to give them careful consideration. They did not propose any immediate steps with regard to the Grand Junction Company, but the promotion of Bills by the Southwark and Vauxhall, the East London, and the West Middlesex Companies was a circumstance requiring the immediate attention of the Council. The Council had already resolved to present petitions against these Bills, and the draft petitions were now under consideration by the Parliamentary Committee. The Council should not rest satisfied with this, but should take action to obtain the rejection of the Bills altogether. The inevitable result of their being carried would be to increase the vested property of the companies, and to add to the difficulties in the way of the attainment of the Council's objects. They therefore recommended, "That the Council do request those of its members who are also members of Parliament to oppose the Bill of the Southwark and Vauxhall Water Company, the East London Water Company, and the West Middlesex Company on second reading, and to take all possible steps to secure their rejection." These proposals, after some opposition on the part of Mr. Boulton, M.P., who pointed out that the companies were only asking for powers to carry out the recommendations of the Royal Commission, were adopted.

The Council was counted out at twenty minutes past seven.

## ARCHÆOLOGICAL SOCIETIES.

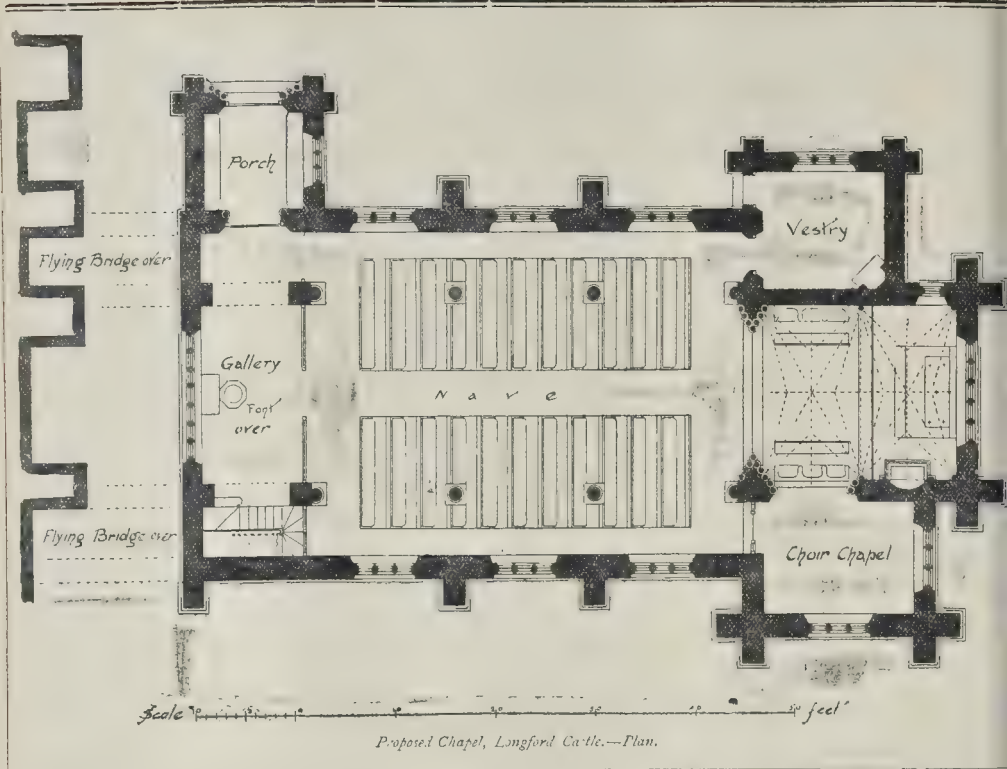
**SURREY ARCHÆOLOGICAL SOCIETY.**—The thirty-ninth annual general meeting of this society took place on the 14th inst., at 8, Danes' Inn, Strand. Viscount Middleton, the President, occupied the chair. The report of the Council was adopted. It referred to the afternoon meeting of the society, on June 17 last, at Esher, when the churches, and Waynflete's Tower, in the grounds of Esher-place, were visited and described. The annual excursion was held on Wednesday, July 26, the meeting-place being Guildford. The part of the Society's Collections (vol. xi., part 2) for the year 1893 was duly issued to all members not in arrears with their subscriptions. This part contains several valuable papers, and numerous illustrations. The Catalogue of Church Plate makes steady progress. The Index to the Calendar of the Feet of Fines is now almost complete, and there is every prospect of an early delivery of the volume. With regard to the finances of the Society there is a small deficit on the year's expenditure, accounted for by the funding of several life subscriptions, formerly treated as current account. The library continues to increase, not only by exchanges from kindred societies, but also by donations from members. The Council will gladly welcome any gifts of books relating to the county. The following members of Council retired by rotation, but were eligible for re-election, viz.:—Lieutenant-Colonel Godwin-Austen, Rev. R. M. Blakiston, and Messrs. Robert Hovenden, J. J. Howard, A. J. Style, and John Watney. The number of members is 315, viz., annual, 218; life 95; honorary, 2. During the year 13 new members have been elected, viz., 12 annual and 1 life. By death the Society has lost 9 members. After the adoption of the report and balance-sheet the retiring members of the Council were re-elected, as also were the hon. secretaries, Mr. Mill Stephenson, F.S.A., and Rev. T. S. Cooper, M.A., F.S.A.; the auditors, Messrs. W. F. Potter and C. Walter Wren; and the collector, Mr. W. P. Ivatts, with votes of thanks for their services.

**GLASGOW ARCHÆOLOGICAL SOCIETY.**—The monthly meeting of the Glasgow Archaeological Society was held in the rooms, 207, Bath-street, on the 15th inst. Mr. Black reported that several important matters had been before the council. With reference to Barochan Cross, Mr. Cunningham, of Craigends, had taken measures for the preservation of the stone. The broken portions had been brought together, and it was intended to have the stone re-erected. As to the proposed removal of the monument of King William III. at the Cross, the secretaries had written to the Town Council expressing the hope that the statue would not be removed far from its present site. Mr. Black also explained that the council hoped to be able soon to issue the report of the committee as to the excavations upon the Antonine Wall. Mr. David Robertson then exhibited and described various MSS. of Tannahill, Motherwell, and other Scottish poets. Dr. Macdonald next read a paper on "The Roman Bridge near Bothwell." Taking up the evidence that was offered in support of the Roman origin of the structure, he reviewed it in detail, coming to the conclusion that proof much more direct and satisfactory was needed before the popular belief could be accepted as well founded. There was no doubt that the road which once crossed it was known at one time as Watling-street. This circumstance more than anything else had led to the bridge being connected with the Romans. But road and bridge were not necessarily of the same age. Whatever might be the meaning of Watling, its application to a road was not meant to indicate that it had been constructed by the Romans. Professor Ferguson afterwards read a note on a tessellated rug, and also notes on early books of secrets.

**"CONSISTORY COURT, CHESTER CATHEDRAL."**—In regard to the drawing of this published in our last, with a wrong title put on it by the lithographer, we beg to say that any purchaser or subscriber who returns that illustration to the publisher of this journal, will receive from him another impression of the plate with the correct title on it.

**ARCHITECTURAL SECTION OF THE GLASGOW PHILOSOPHICAL SOCIETY.**—The Architectural Section of the Glasgow Philosophical Society met on the 19th inst. in the hall, Bath-street—Mr. Campbell Douglas presiding—when Mr. Hippolyte J. Blanc, A.R.S.A., architect, Edinburgh, read a paper entitled "A Few Notes on the Collegiate Churches of Scotland." The paper was illustrated by a number of lime-light views.





### Illustrations.

#### WINDOW, GERRARD'S CROSS, SLOUGH.

THE window of which we give an illustration was executed by Messrs. Shrigley & Hunt for St. James's Church, Gerrard's Cross, near Slough. The subject is the Holy Women and SS. John and Peter met by the Angels at the Tomb of Christ; the angels being in the centre light, and the groups of the women and apostles respectively occupying the left-hand and right-hand lights. The window is of large dimensions, and the colour scheme full and rich.

#### BINGHAM'S MELCOME, DORSETSHIRE.

This interesting old house is situated in the centre of Dorset, about ten miles north-east of Dorchester.

In remote times it belonged to the old Dorset family of Turberville, and during the reign of Henry III. it came into the possession of the Bingham through the marriage of Sir William de Bingham, of Sutton Bingham, Somersetshire, to Lucie, heiress of Robert Turberville, and from that time to the present day it has been the seat of the Bingham, without a break in the male line.

Hutchins, in his "History of the Antiquities of Dorset" says, that from an inventory of the possessions of Robert Bingham, in the fourteenth year of Elizabeth, "it would seem that the house has undergone very little substantial alteration since that date." There is no doubt but that the greater part of the present house was built during the reign of Queen Mary, but there are several remains of a much earlier house. The entrance is through a buttressed gate-house into a singularly picturesque court. In front, raised on a terrace, stands the main portion of the house, consisting of a hall, 31 ft. by 18 ft., with a magnificent oriel which has a projection of 15 ft. The detail of this part is of considerable richness, and the work is particularly refined. To the right of the hall in a part of the building that has been modernised at a comparatively recent date, there have been found traces of the great kitchen with the ladies' parlour above it.

On the left of the oriel a range of offices with bedrooms above connect the hall with the gate-house. In the oriel windows are stained glass panels of contemporary date with the house,

bearing the arms of the Bingham, and the various families with whom they had married at that date.

During the last century the roof of the old hall was destroyed, and attics formed by raising the eaves level and substituting a flat slate roof for the old steep pitched one.

The hall has now been re-roofed, externally regaining the ancient form. It was found necessary to rebuild the back wall of the hall, but restoration to the stone-work elsewhere has been carried out without pulling down. A drawing-room has been formed on the first floor in what was originally the ladies' parlour, though it had since been cut up into bedrooms. The roofs were stripped throughout, the timbers repaired, and the old stone slates replaced. The internal woodwork has been restored and renewed where absolutely necessary, including the panelling, of which there is much, of various dates and degrees of excellence.

The sanitary work and water supplies have been completely re-arranged. The work has been carried out by Mr. A. H. Green, of Blandford, under the superintendence of Mr. Evelyn Hellicar, architect.

#### PROPOSED PRIVATE CHAPEL, LONGFORD CASTLE.

The illustration shows an interior view of the proposed private chapel at Longford for the Earl of Radnor. It is situated on the east side of the castle, the east end of the chapel overlooking the river Avon.

The chapel is intended to seat 180 persons, and consists of nave and aisles, chancel choir chapel with organ over, and vestry. At the west end is a gallery connected with the castle by means of flying bridges opening out of the great saloon.

The chapel will be built of local stone and flints, with Ham Hill stone dressings.

Internally the roof of nave and aisles will be of oak grown on the estate. The chancel roof will be groined, the ribs being of oak, with the spandrels of plaster.

As will be seen from the illustration, it is intended, as far as possible, to re-use the semi-classical caps, columns, fittings, and oak panelling taken from the original chapel pulled down about the year 1700, but of which no drawings or description can be discovered.

It is also intended externally to re-use the

masonry taken from the twelfth-century monastery of Ivy Church, about a mile distant, recently pulled down.

The architect is Mr. G. Hamilton Gordon, London.

#### ST. MARY'S CHURCH, BEVERLEY.— ROOD-SCREEN.

THE illustration shows the western side of the rood-screen, which has recently been restored to its old position. It seems clear that the screen was erected after the fall of the central tower in 1520. At some unknown date, between the Reformation and the present generation, the tower was taken down, and the screen was mutilated by the destruction of about half of each of the side bays, and of the vaulted cove and cornice, in order to make it fit a narrower space under the eastern arch of the crossing. Here it stood until A. W. Pugin commenced his restoration of the church in 1844; but, although his report contemplated the re-erection of the screen, the work was not carried out. As will be seen from the plan, the complete screen was a double one, its western part standing some 10 ft. west of the back of the returned stalls, and the whole was covered by a very wide loft. The four posts, AA, BB, which supported the loft, are still preserved in the church; but at present only the western part of the screen has been restored. Practically, the whole of the lower part of the screen is old, with the exception of the completion of the missing halves of the side bays. No remains existed of the vaulted cove and cornice, and these are entirely new. The restoration has been carried out by Messrs. J. E. Elwell & Son, of Beverley, under the superintendence of Messrs. Botterill Son & Bilson, architects, of Hull.

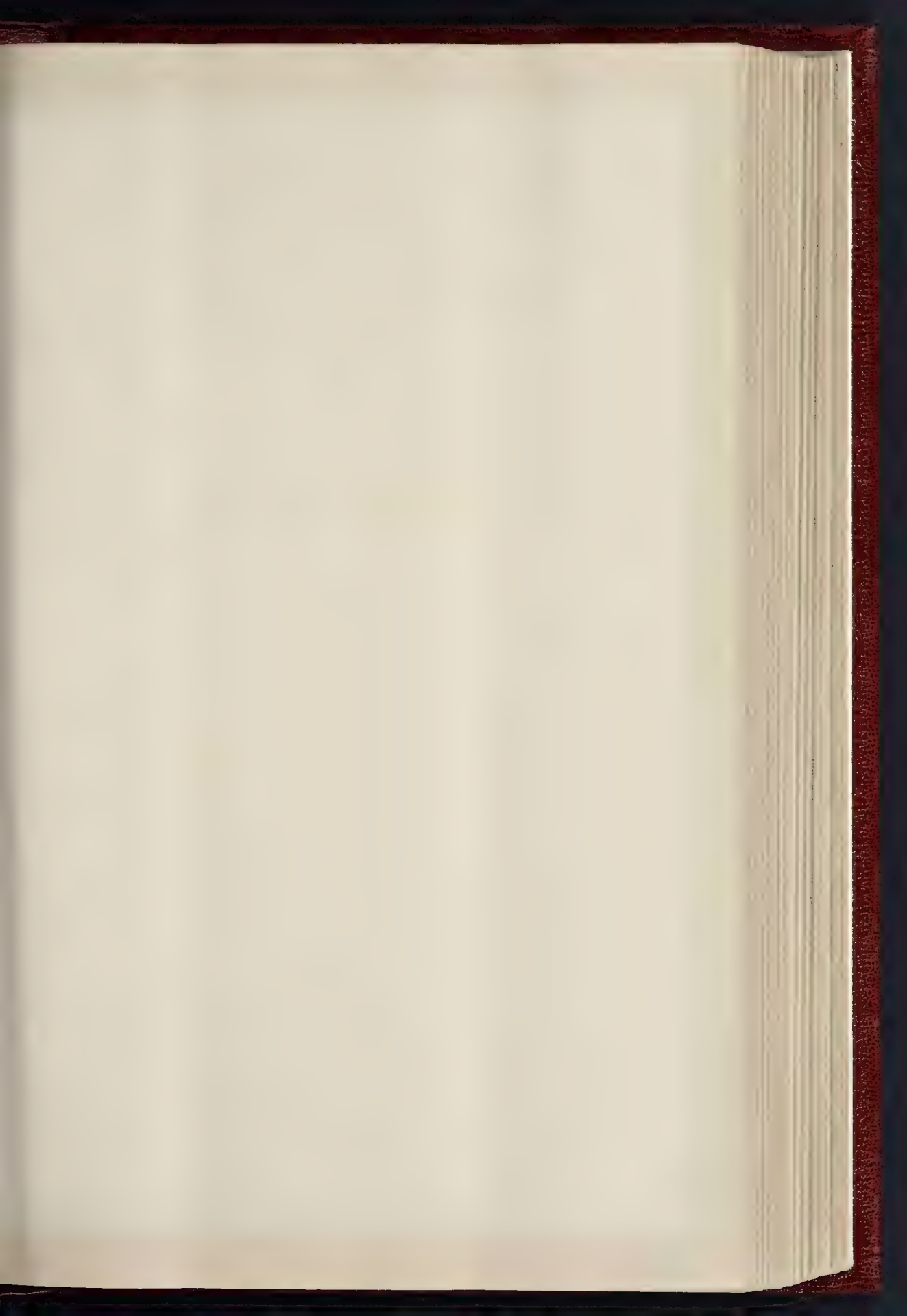
#### DESIGN FOR A COUNTRY HOUSE.

This design for a house, by Mr. Richard Willock, was intended for a site having considerable fall, advantage of which has been taken in the formation of a terrace along one side on to which the principal rooms open.

The chief features in the design are the strongly marked horizontal cornices.

The intention was to produce a quiet-looking house, and one suitable for an ordinary country locality.

The drawings were exhibited at the Royal Academy last year.





THE BUILDER MARCH 22 1894





BINGHAMS MELCOMBE DORSETSHIRE AS REPAIRED WITH PARTIAL ADDITIONS MR. EZEKIEL BELLEFAR ARCHAEOLOGIST









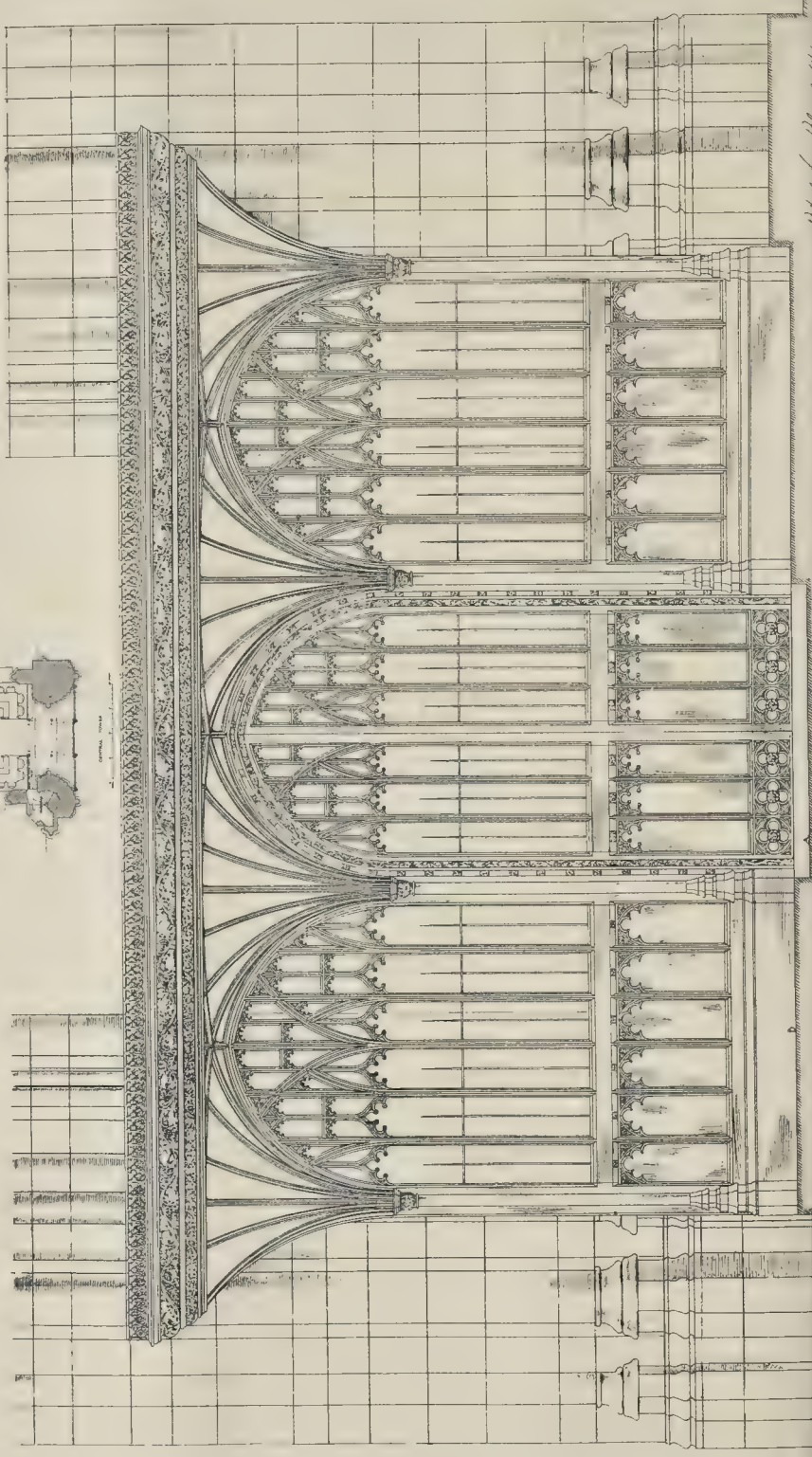
THE BUILDER, MARCH 24, 1894.

ST. MARY'S CHURCH · BEVERLEY ·  
· RESTORATION · OF · ROOD · SCREEN ·



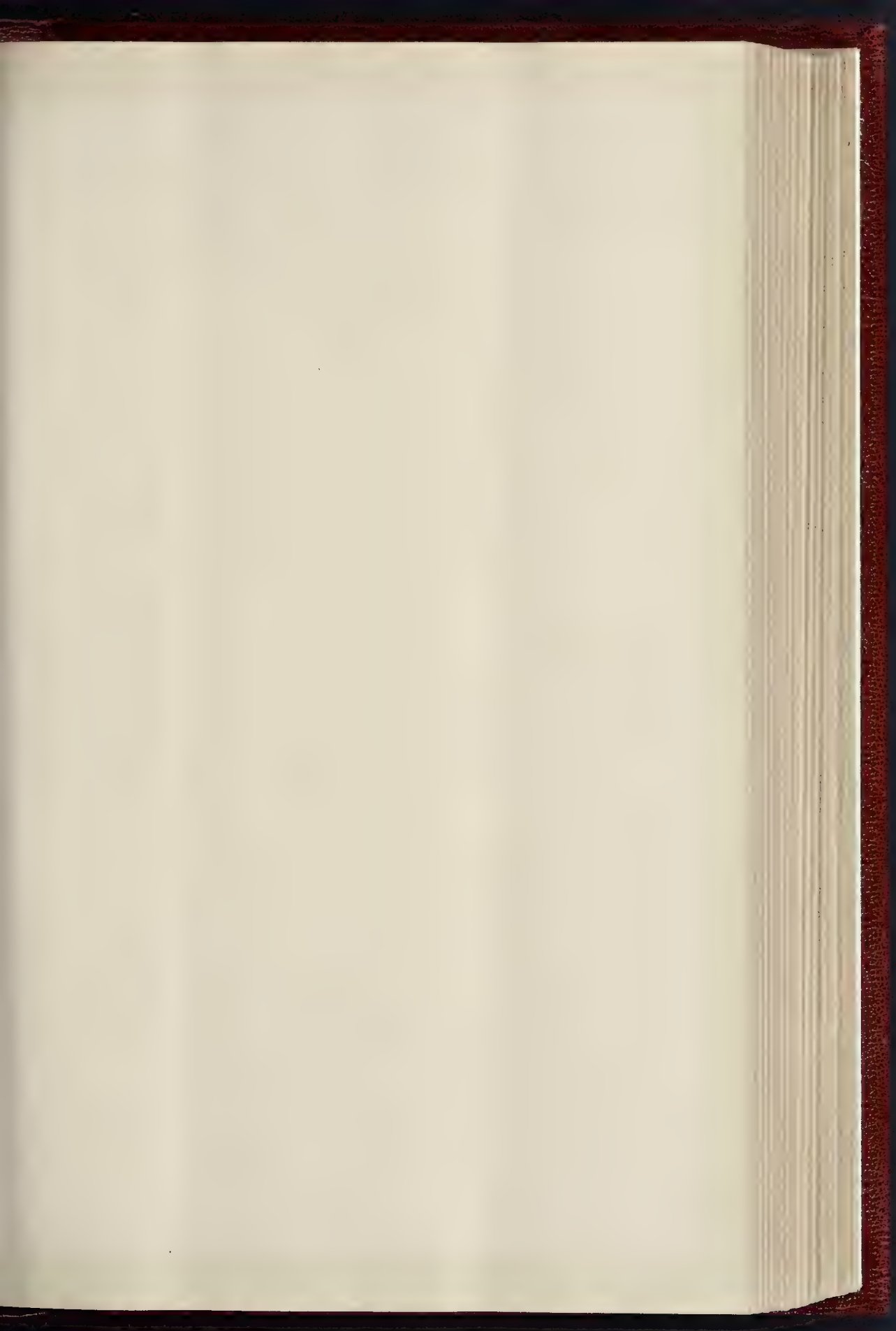
SCALE ONE INCH TO A FOOT.

FEET



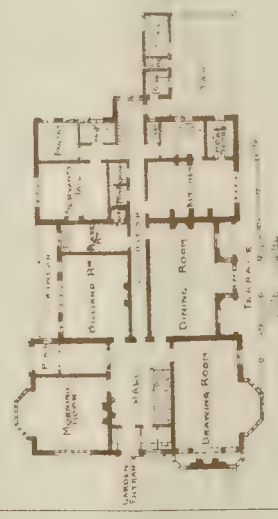
Robert Wilson 1894

ELEVATION OF THE WEST SIDE OF THE SCREEN.

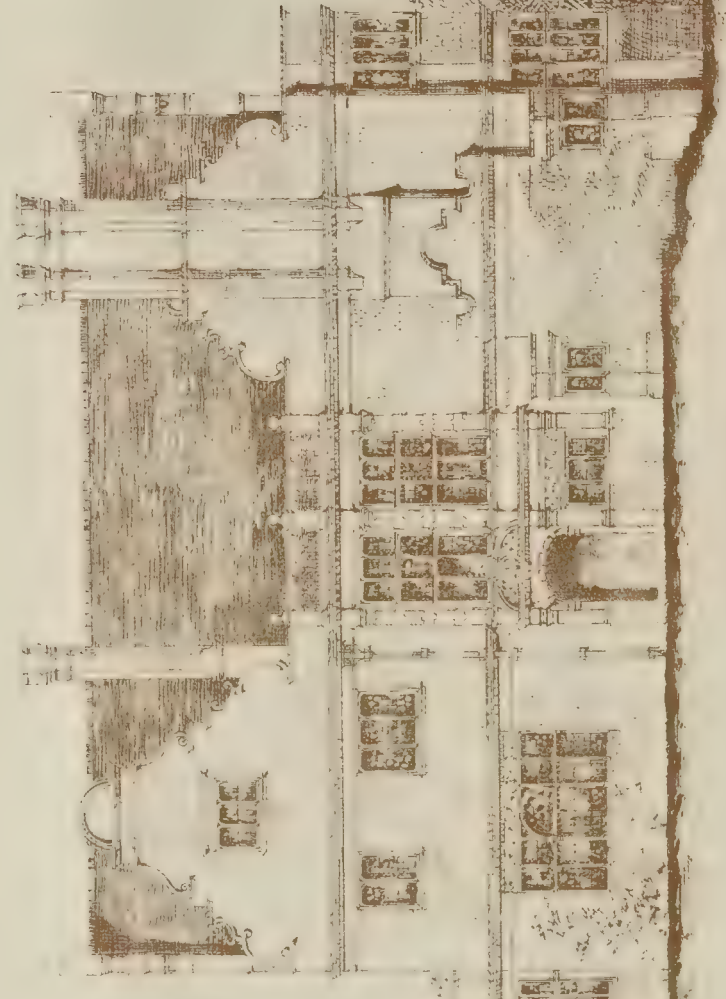




THE BUILDER, MARCH 24, 1904

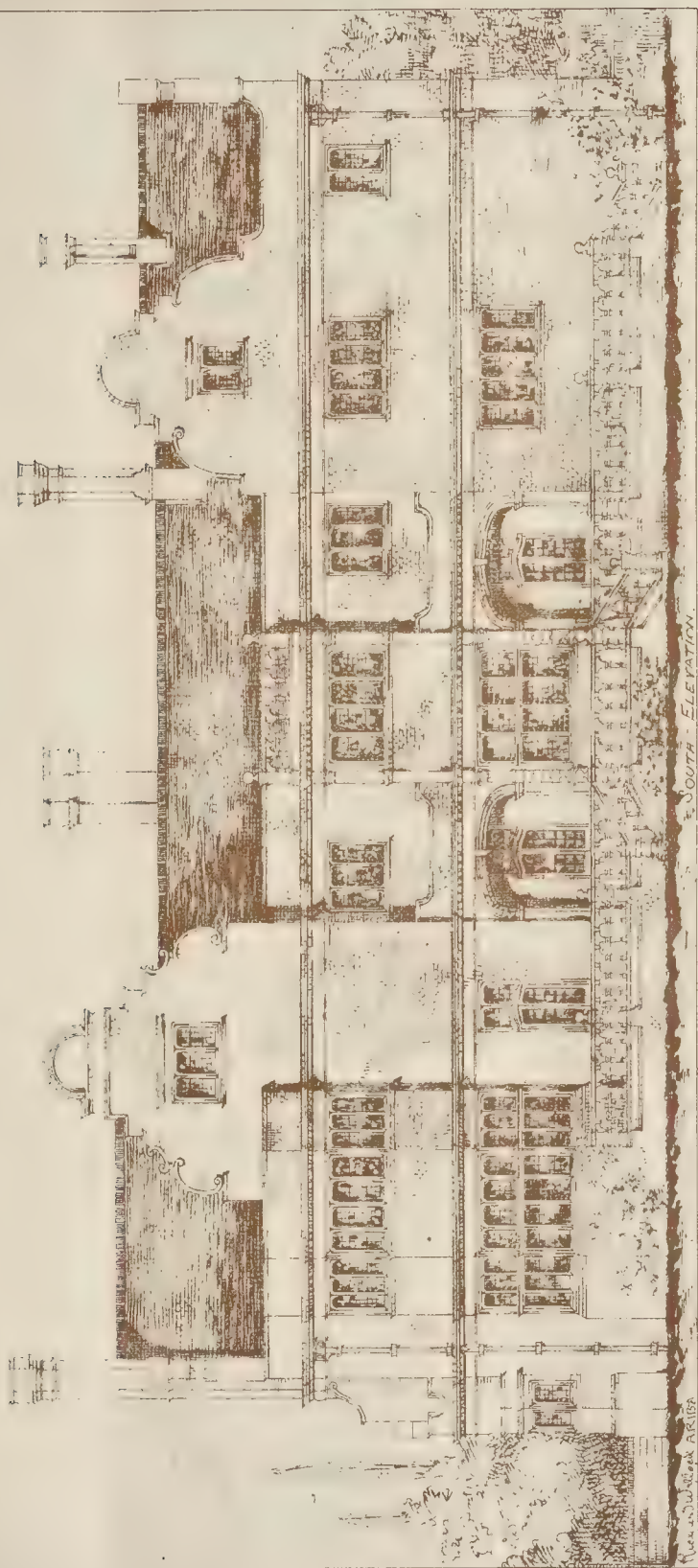


FIRST FLOOR PLAN.



WEST ELEVATION.

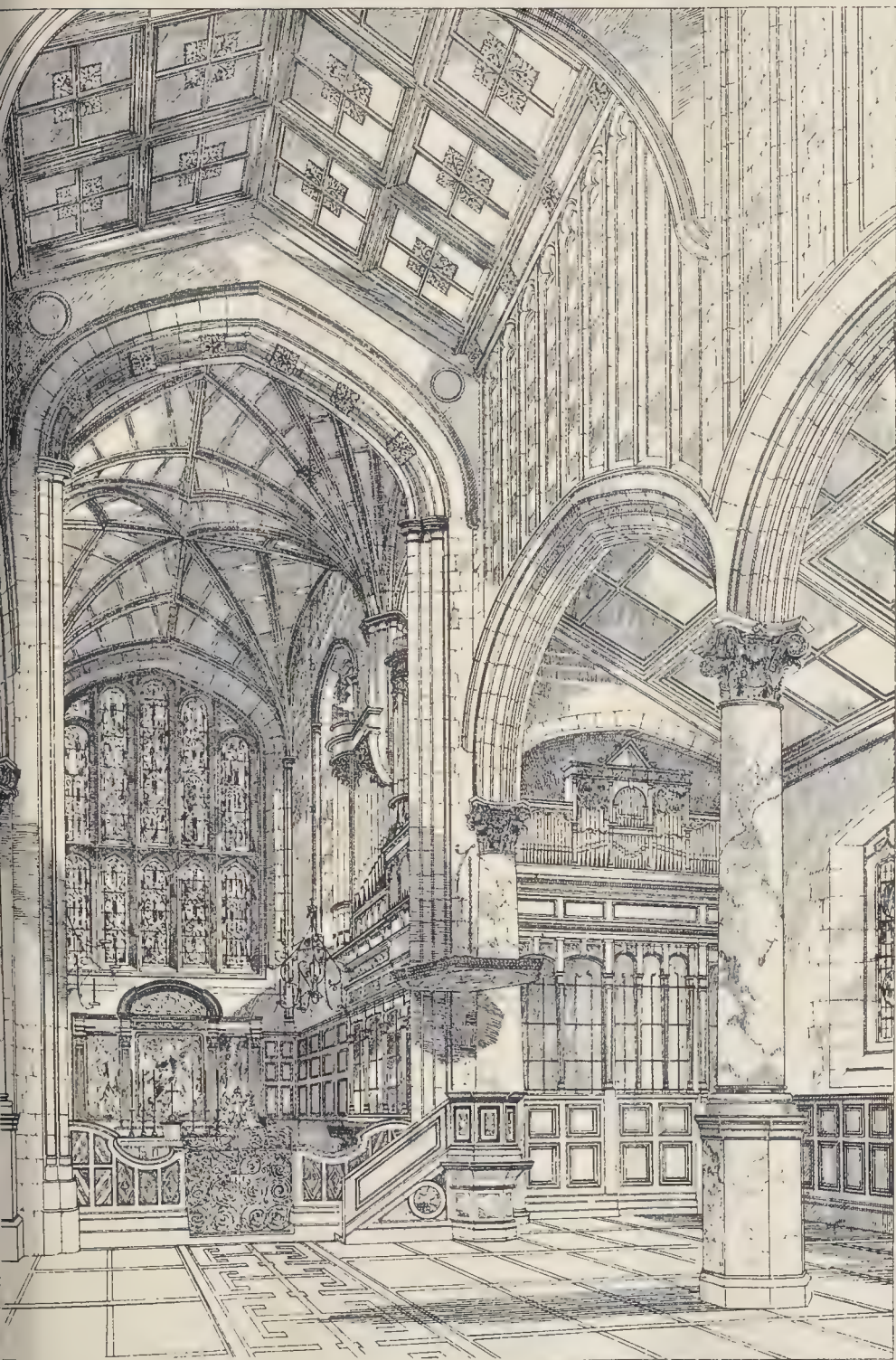
DESIGN FOR A COUNTRY HOUSE - BY MR. RICHARD WILLOCK, A.R.I.B.A.



DESIGN FOR A COUNTRY HOUSE. B. M. RICHARD WOOD ARCHA







WILLIAM H. STONE, F.R.S., ARCHT. EAST WARD OF CHURCH OF ST. JOHN, LONDON.

PROPOSED PRIVATE CHAPEL, LONGFORD CASTLE, WILTS. MR. G. H. GORDON, A.R.I.B.A., ARCHITECT.

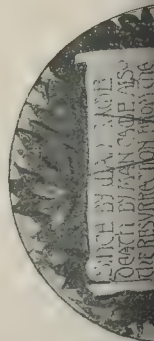
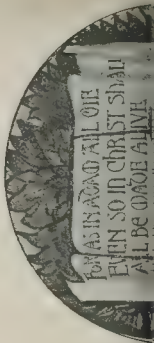
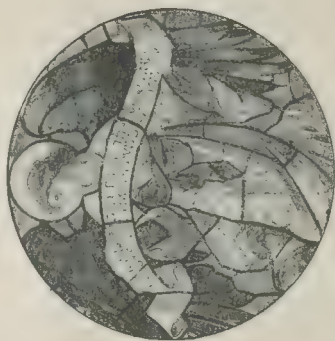


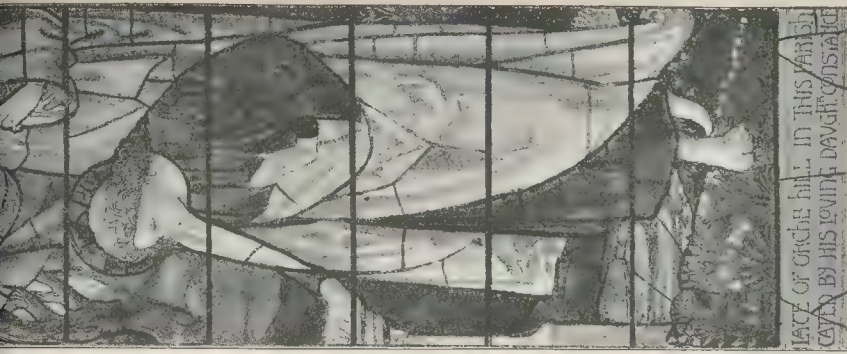
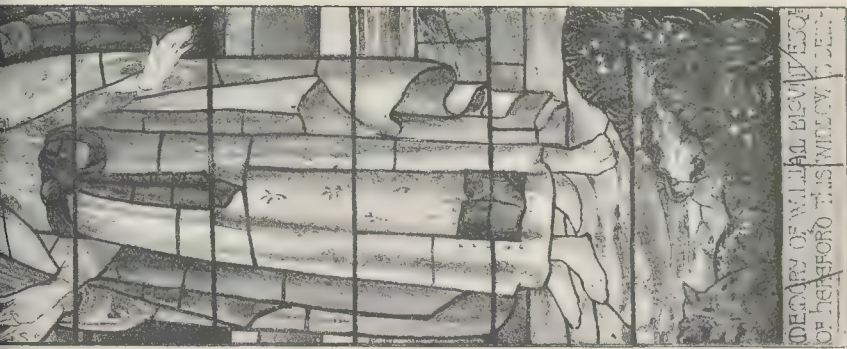
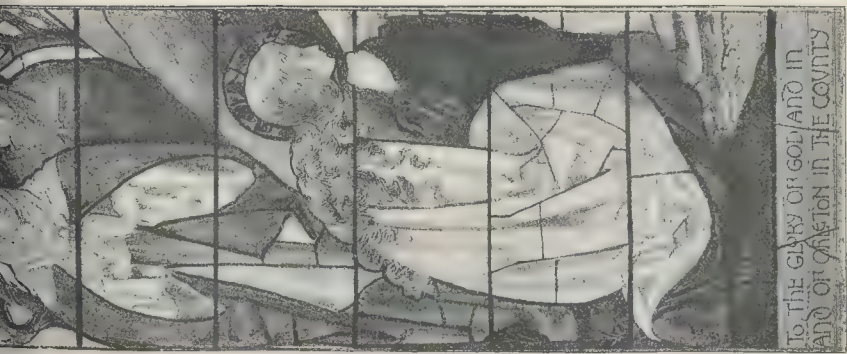






THE BUILDER, MARCH 24, 1894.





EAST WINDOW, ST. JAMES' CHURCH, GERRARD'S CROSS, NEAR SLOUGH, BUCKS.—BY MESSRS. SHRIGLEY & HUNT.





# ARCHITECTURAL ASSOCIATION : OLD ARCHITECTURE IN EAST LONDON.

An ordinary fortnightly meeting of this Association was held on the 16th inst., in the Lecture-room of the Royal Institute of British Architects, 9, Conduit-street, Mr. E. W. Ford (President) in the chair.

Following gentlemen were elected members of the Association, viz., Messrs. T. P. Dobson and Wilkin.

Thanks were passed to Mr. Ingress for conducting the members over the United States Institution, and to Messrs. Leeming and Taylor in connexion with the visit to the Admiralty Offices on March 3.

President called attention to the lectures on Old Architecture by Mr. E. T. Hall, commencing on the 16th. These were very important lectures, and a good many names would be sent in.

President also announced that a special gathering of the members would be held that day for the consideration of the London and Buildings Bill, now being promoted by the London County Council. This was an important subject, affecting the whole of the profession, and he trusted there would be a large attendance.

F. E. Masey then read the following paper on Old Architecture in East London, illustrated by ten photographs :—

Not long since I inquired of an architect whether he knew East London. He replied in the affirmative, saying he had seen it in the railway carriage when passing through the way to Great Yarmouth.

Certainly the panorama so obtained is in many ways sad and depressing enough to excite any curiosity to make its further acquaintance.

Taking an average dull day for the view the weather in this part seems somewhat dull; the spectator may behold a picture of the prevailing tones are mournful greys, and the details chiefly composed of rows of mean dwellings separated by still or courts and back-yards. Here and there schools and mission churches in severe brick break the monotonous level of panoplies. Beyond these a fringe of chemical works, rag yards, rope walks, and the like, then a horizon bounded by factories, warehouses, and sheds, with a few spires and some huge of brickwork called "model dwellings" interspersed. Above all smoke, smoke everywhere, from the countless rows of red chimneys to the larger streams issuing from the chimneys, and then melting imperceptibly into the murky atmosphere which overlays this region large grey blanket.

There must be many here who know that this picture is in no way overdrawn. It is a picture which is indicative of the sad, dull, and squalid lives passed by many of the inhabitants, rich, for unmitigated hideousness, cannot, in fact, be surpassed, and, I trust, scarcely need. I have ventured to remind you of this, in the aspect of East London, in order to draw attention to the extraordinary change in character and appearance which this district has undergone in the past century and a half.

It is most difficult to realise how comparatively recent is the unsavoury reputation which it has acquired. In endeavouring to put this fact as forcibly as possible before you this evening, I feel that I am only doing my subject bare justice, for this district has played an important part in London's history for 800 years, and was the chosen spot for residence of the wealthier inhabitants for centuries before what is now called the West-end had emerged from its primitive state of meadow and marsh.

In proceeding to describe the few remains of old architecture in East London, I should like to say, as briefly as possible, the rise and fall of Stepney, as we are able to gather it from the oldest records up to the present time, for the history of Stepney is the history of East London. In the year 604, the deserted Roman city was invaded, and, and practically re-peopled by the East Saxons. Miletus became its first bishop in 604, and after that we have information relating to the district from which we may gather that its history is contemporary with that of London itself. Interesting to note traces of the East Saxon people plainly discernible down to the present amongst the inhabitants of the East, and Mr. Mallet points out that the so-called cockney is really nothing more or less than pure dialect.

Far back as Saxon times we have records of the manor of Stebenhythe, spelled in half-a-dozen

ways. The manor extended eastwards from the City to the River Lea, and was bounded on the north by what is now Hackney parish, and on the south by the river.

When Domesday was taken, Stepney Manor was described as part of the ancient desmesnes of the Bishopric of London, and valued at 48*l.* per annum. The manor house stood a quarter of a mile north-east of what is now Bethnal Green. The Saxon church was called All Saints. Dunstan was made Bishop of London in 957, and probably for a time lived in Stepney. He built the church, and to his memory it was afterwards dedicated.

The derivation of Stebenhythe is supposed to be from Steb, the trunk of a tree, and hythe, a wharf. The following description by Fitz Stephen in Henry II.'s reign probably includes Stepney :—"On all sides without the houses of the suburbs are the citizens' gardens and orchards, planted with trees, both large, slightly, and adjoining together beyond the pastures and plain meadows." Towards the north he described the meadows as "having brooks running through them, turning mills with a pleasant noise," and further, "a great forest, a well wooded chase having good covert for harts, bucks, does, bears, and wild bulls."

The Bishops of London seemed to have found Stepney a pleasant place, for they constantly resided there between the eleventh and fifteenth centuries. We read that one of them tried to make a game preserve here in 1252, but the Mayoralty of London, already a rival power, effectively opposed and prevented it, so that the said Bishops had to content themselves with tournaments, which were for long after held at Bishops' Hall, the name by which the manor house was known. In 1299 the king held at Stepney a Parliament in the mansion of Henry Walters, Mayor of London, on Mile End Green, on which occasion the Charter of Liberties was confirmed. Up to this time there is not very much information to be gathered about Stepney, and it was probably a small and somewhat unimportant place, but from about 1300 its active history may be said to commence. It is interesting to note how early the inhabitants showed their independent character and demonstrating capabilities from the fact that in both the insurrections of Wat Tyler and Jack Cade they played a conspicuous part. The first step towards the division of Stepney was taken early in the fourteenth century, when the Whitechapel, called St. Mary Matfelon, was built as a chapel-of-ease. Soon after (1338) it became a parish to itself. The origin of the name is unknown, though there are several more or less improbable traditions to account for it.

About this time the inhabitants of the eastern portion of the parish, called Stratford Bowe, being frequently unable to attend church owing to the flooding of the fields by the River Lea, a chapel was built and provided with a curate for their accommodation. The name of Bow is stated by Leland to be derived as follows :—"Matilda, wife of Henry I., having herself been well washed in the river, caused two bridges to be built in a place one mile distant from the Old Ford, of which one was situated on the Lea at the head of the town of Stratford, now called Bowe, because the bridge was arched like unto a bowe, a rare piece of work, for before that time the like had never been seen in England."

Early in the fifteenth century the Bishops ceased to reside in Stepney, but the spot had become a favourite one for the country houses of the richer London merchants.

The reign of Henry VII. saw the rise and development of two great movements, in both of which Stepney played a conspicuous part, the pre-Reformation efforts for religious reform and the development of the Navy. Regarding the former several Stepney vicars stand conspicuous. Bishop Fox, a great patron of the new learning; Dr. Heynes, who was sent abroad to confer with Melancthon; Dean Colet, a leader of advanced thought, and founder of St. Paul's School; William Jerome, who paid the price of being before his time lying by being burned at Smithfield in 1540, and several others.

The spirit of independent thought seems early to have taken firm hold of Stepney, for it afterwards became a stronghold of Puritanism. Respecting the second influence under which Stepney developed, the demand for ships soon caused houses, yards, and stores to creep along the river bank, although the country behind, between them and the Mile End-road did not alter its rural character for many a century afterwards. The result of this growth of naval enterprise was Ratcliffe, Blackwall, and Deptford. At Deptford was built the famous *Great Harry*,

which was commanded by Sir Thomas Spert, who also founded the Trinity House, and who was buried in Stepney Church.

At Blackwall, some little time after, was built the Brunswick Dock, which was the commencement of the magnificent series which now lines the river bank.

In 1550 the manor of Stepney passed away from the bishops of London after having been held by them nearly 600 years. Nicholas Ridley, Bishop of London, alienated the manor from the see and gave it to Edward VI., who granted it immediately to Thomas, Lord Wentworth.

At this time the manor included several smaller manors, villages, and hamlets, which one by one were detached and became separate parishes. The principal of these were Shadwell (Chad's Well), Spitalfields, Limehouse (Lymehurst), Stratford-Bowe, Bethnal Green, and Poplar or Popler.

In 1625, and again in 1665, Stepney suffered exceptionally severely from the plague, although this was probably due to its close connexion with the river trade and the foreign shipping rather than from any inherent unhealthiness in the place itself. In spite, however, of these calamities the locality continued a fashionable one.

In 1663 the Marquis of Worcester built his mansion on Stepney Green, and we read that in the following year the king instituted a weekly court of record within the manor and granted a weekly market at Ratcliffe Cross, as well as a Michaelmas fair on the Green. Of these privileges one at least survives in the Haymarket still held in Whitechapel.

In 1642, when the City was surrounded by a trench, fortifications were made at Mile End, sailors being employed for the work. The fortress which was intended to defend the approaches to the city from the eastern road was in the parish of Whitechapel. It was originally made 329 ft. in length, 182 ft. in breadth, and about 25 ft. high. The place was levelled to make room for a row of houses at the beginning of this century. The place is called "The Mount," and the rise of the ground may still be noticed.

Meantime the riverside hamlets continued to grow in importance. Writing in 1598, Stow complains that "there hath been of late in place of elm trees many small tenements raised towards Ratcliffe, and Ratcliffe itself hath been also increased in building eastward (in place where I have known a large highway with fair elm trees on both the sides) that the same hath now taken hold of Lymehurst, corruptly called Limehouse, sometime distant a mile from Ratcliffe."

Between 1660 and 1743 the districts known as Shadwell, St. George's, Spitalfields, Limehouse, Stratford, Bow, and Bethnal Green, were detached from Stepney, and became separate parishes, owing largely to the increase of population caused by the rapidly-growing trade at the Port of London.

During this period, as the following figures will show, Stepney, the mother parish, continued a small place.

Between 1680 and 1685 the births averaged 1,380 annually.

Between 1790 and 1793 the births averaged 2,260 annually.

On the main road, however, between London and Stepney houses were commencing to be built.

In 1673, Philadelphia, Lady Wentworth obtained the King's permission to build upon a piece of land called West Heath, on the road to Stratford-Bow. Sir Christopher Wren was employed to survey the ground, and give his opinion on the eligibility of the site. We will refer to his report later on when passing the place in question.

Before closing this brief notice of the history of the manor, it may be interesting to note its further changes of ownership after having been given, as already mentioned, by Edward VI. to Thomas, Lord Wentworth.

From the latter it descended to Thomas, Earl of Cleveland, whose estates were confiscated in 1652. Sir William Ellis, Cromwell's solicitor, was then made steward of the manor, valued at 200*l.* per annum.

After the Restoration the Earl of Cleveland recovered a part of his property, amongst the rest this manor, which remained in his family until 1720. In 1754 it passed to the Colebrooke family, the present lords of the manor.

The eighteenth century saw the gradual decline of this venerable suburb from its position as a fashionable locality, although it continued a favourite residence of the middle classes down to fifty years since. The next and last important event in the history of Stepney was the building of the docks, to accommodate the enormous



expansion of trade with the East and West Indies. Soon after the commencement of these enterprises Stepney, with its mansions and cottages, fields and trees, gardens and pastures, disappeared as if by magic, and in its place arose the East London of to-day.

Many were the interesting buildings demolished one by one to make room for the swelling population. In a few cases we have contemporary drawings, more or less authentic, of what then existed, but in many more there is nothing but a meagre record of the fact of their disappearance. In deploring that so little information is handed down to us, it must be remembered that, until comparatively recently, methods of illustration were few and tedious, and the times apathetic in matters artistic. Nowadays, although facilities for obtaining authentic records are great, one has reason to know that much that is historically and architecturally valuable, disappears yearly without any such record being made; and although a Government camera could, with small expense and probable profit, perform the needful part in respect to our vanishing old buildings, yet it has been left hitherto to a few disinterested and enthusiastic amateurs to preserve any memorial of them.

In regard to this matter I should like to draw the serious attention of our Camera Club to the fine opportunity here presented to them of doing a really national work. It would be one in which their peculiar knowledge would give them a great advantage, and which, if systematically and thoroughly carried out, would be most valuable, and would earn for them the gratitude of the architectural, archeological, and artistic worlds.

In the following short and necessarily imperfect description of some of the old buildings remaining in East London, it will be found convenient to take an imaginary journey eastwards from Aldgate as far as Bow, thence to the river, and to return by the river streets to the Tower.

Leaving Aldgate, the gate of the East, behind us, we make our way with difficulty through a busy crowd, which includes Hebrews, butchers, slaughtermen, city clerks, and Essex farmers, and where railway vans and hay carts, brewers' drays, and funeral processions contend with unwieldy trams for the mastery of the road. We should first notice the group of houses on the south side of the street known as "Butchers' Row." Amongst them is a wine and spirit house of long standing, with a quaint old bar and scoring board. Mansell- (or Maunsell) street leads off to the right. Here several fine old houses of a well-known type still remain.

On the north side of Aldgate the last of the historic hostleries has long since disappeared to make room for "improvements." A short distance further east and then the Commercial-road branches off to take the heavy traffic to and from the docks.

Here commences Whitechapel High-street. On the left are some houses of Restoration date, which group well with the tower of the new Free Library beyond.

Opposite stands the conspicuous spire of St. Mary Matfelon. Of the origin of this strange word there are many explanations, but none satisfactory. Drawings extant show the old church to have been much of the same type as that of Stepney. There is reason to believe that a chapel existed here long before the fourteenth century when the "white chapel" previously referred to was built. Behind the church lies the picturesque and historic bell foundry of Mears & Stainbank, where many famous bells have first seen the light.

A little further on we pass "The Mount," a row of houses on slightly raised ground, which occupies the site of the fort raised in 1642. Beyond is the London Hospital, built by Mainwaring in 1752, and furnished with nearly 800 beds. The exterior is simple and dignified in treatment, and seems to be more suited to its purpose than many more ambitious buildings whose pointed turrets and florid detail sometimes suggest a music-hall rather than a House of Mercy.

Within, the upper floors are served by two substantial oak staircases, which also contrast favourably with more modern developments.

One of these takes the traffic of half the hospital and is known not to have been repaired for upwards of fifty years, whilst a stone external staircase close by, built in 1876, and taking only a fourth of the traffic, has had to be repaired twice since its erection.

Nearly opposite the hospital starts the old road leading to Bethnal Green. There is little there now to reward a visit, although the neighbourhood

was in old days a rival to Stepney in popularity and possessed fine houses in abundance.

The name is supposed to be derived from the Bathon family, who held property here in the reign of Edward I. The memorials of the parish are most interesting, and to do justice to them would need much more space than we have now at our disposal.

The most important building in Bethnal Green parish was the residence of the Bishops of London, the ancient Stepney Manor House, and known as Bishops Hall. It was situated about a quarter of a mile to the N.E. of the Green and remained until 1844, when it was swept away in the making of the Victoria Park.

The parish was separated from Stepney in 1743 and the church built in 1746.

Amongst other noted buildings were "Kirby Castle," a large house facing the Green, built by John Kirby in the sixteenth century and a chapel standing at the N.E. end dedicated to St. George.

Both these buildings disappeared about ninety years since. Beyond is Hackney, rich in history and associations; but, as Hackney does not consider herself in East London, we will retrace our steps to Mile End-gate and resume our journey east. Just beyond the curious old inn standing isolated on the "waste" we reach one of the gems of East London Architecture still remaining, the Trinity Almshouses.

These almshouses were founded in 1605 by the Corporation of Trinity House for twenty-four old commanders or mates of ships, their wives or widows. Architecturally these buildings are in their way admirable; the general treatment quiet and unobtrusive, as befitting their use, and the detail excellent and appropriate. The dwellings occupy two side of a quadrangle, the chapel the third side, and a boundary-wall and railing, with handsome gate-posts on the street side, separate the inhabitants from the roar of the Mile-End road.

The ends of the dwellings abutting on the street are gabled and ornamented with models of ships of the period. The doorways are grouped in couples, each with its flat carved porch; each pair of dwellings shares an ornamented lead cistern placed between them. The centre of each block is treated with a pediment, with carved tympanum.

The dwellings were originally returned along the north side to meet the chapel in the centre, but they were demolished to make room for the extension of the buildings at the back. In the centre of the quadrangle is a statue of Captain Sandes, a former benefactor.

The glass in the chapel is noteworthy, it having been taken from the old hall of Trinity House, at Deptford, when it was pulled down in 1786.

Adjoining the Trinity on the west side are the Skinners' Almshouses, built in 1698. They are very similar in character to their neighbours. It is much to be regretted that the site has been sold, and that these quaint and interesting buildings will shortly be demolished, to make room for a new Jewish synagogue. Further east on the same side are the Vintners' Almshouses, of later date, and no architectural interest.

It seems a pity that a form of benevolence so satisfactory to all parties concerned should have been belittled out of fashion by the wholesale system of charity, if I may so call it, which nowadays obtains favour.

In Lysons' "Environs" a plan is given of this part of the parish, drawn by Sir Christopher Wren in 1673, who was asked to report upon the suitability of the site for building, by request of Philadelphia, Lady Wentworth, who had obtained the King's permission to build there.

We have now reached the north end of Stepney, or Mile End Green. The Green is now enclosed and planted with flowers, and appears well cared for. There are several comfortable-looking old houses left to remind us of the bygone prosperity, but of the great mansions none remain. The last one—that built by Sir Henry Colet (father of Dean Colet), called Great Place—was cleared away some years since. Hard by was the famous Worcester House, built by the Marquis in 1663, of which the gateway remained in 1810. It stood opposite the ancient rectory, or church house, near the east end of the church. A little further on, at the corner of Whitehorse-street, was the house given by Dean Colet, when founding St. Paul's School as a country house for the head masters, and which continued to be used as such until the present century. Nothing now remains of it, but the great name is kept in memory by "Colet-place."

We have now arrived at Stepney Church. In spite of two centuries of tinkering, and its present

grimy surroundings, the exterior retains a certain amount of dignity and architectural character.

The plan of the present church consists of chancel, nave, and two aisles. It is of a late fourteenth-century date, and needs special comment. On entering the south aisle we are reminded of the existence of one of the previous churches by a carved panel representing the Crucifixion, of the twelfth century; there the mutilated remains of a Holy water stoup, first thing to strike one on entering is the gallery over each of the aisles. They are so as not to interfere with the nave arcade, are indications of more prosperous times. The first was erected in 1601, and the other added in 1684 to accommodate the large increase of congregation caused by the Great Fire. The north porch is another relic of the previous church—i.e., a carved panel, too decayed to be subject to be identified. Near the west door a modern Norman font rests on a black and white plinth. This was the tombstone of the infant Darnley, elder brother to the father of James VI. The child was buried beneath the altar, and this stone was removed some years ago to be put to this not altogether inappropriate use.

The church contains many handsome tombs, chiefly Elizabethan and later. The most one is in the north side of the chancel, the tomb of Sir Henry Colet, citizen and mercer of London. He was Mayor between 1486 and in memory of his more distinguished son, the founder of the St. Paul's School, the church faithfully kept in repair by the Mercers' Company. On the south side are thirteenth-century remains from an earlier building.

Near the Colet tomb is one to Alderman Colet, dated 1510. There are many other notable graves and monuments in the church, notably Anne, Lady Wentworth, 1571; John Kyte, Bishop of Carlisle; Richard Pace, Dean of St. Paul's; Nicholas Gibbon, Sheriff of London; Sir Thomas Spert, founder of Trinity House, and others.

The remains of the ancient rood-screen exist till 1621. In 1622 a three-decker was erected and the King's Arms, and the Creed, the Lord's Prayer, and the Ten Commandments were put up, says the record, "after a handsome and beautiful manner."

During the Plague the churchyard was a great strain, and a plague-pit had to be made on the north side of Mile End-road. This is shown on Sir Christopher Wren's plan. The records here are very perfect and interesting, the vestry minutes have been kept with the greatest care from 1579. They have lately been carefully edited and printed under the title "Memorials of Stepney Parish," by the Rev. W. Hill, and Mr. W. H. Frere, and from I have gained much interesting information. Before leaving the church we should not forget to look at the wall near the west door having the following curious inscription:—

Of Carthage wall I was a stone,  
O Mortals read with pity,  
Time consumes all—it spareth none,  
Man, mountains, time, or city.  
Therefore, O Mortals, now bethink  
You whereunto ye must  
So ere now such stately buildings  
Lie buried in the dust.

THOS. HUGHES, Esq.

After glancing at the interesting collection of maps, prints, and relics of Old Stepney Church preserved in the vestry, we must retrace our way to the Mile End-road in order to see Bow Church, which lies in the main road a mile and a half eastward. We pass another group of old houses on the north side of the road, and then the People's Palace, noting that it displaced the old St. Paul's, founded in 1277 for the maintenance of 24 poor men and the clerical 100 boys. A short tram ride brings us to Bow Church, or, to call it by its proper name, Stratford-Bow, standing right in the centre of the road.

Stratford-Bow Church, as already mentioned, was built as a chapel-of-ease to Stepney after long rivalries and quarrels it was made a separate parish in 1719. The bells of the church were the famous ones mentioned in the rhyme. The church is dedicated to St. Andrew and was built early in the fourteenth century, consists of a chancel nave and two aisles.

There are one or two interesting monuments in the church, and some old Flemish glass. There is nothing of special interest in the architecture. Opposite the church are some old houses, of which still serves useful purpose as a club for young women. We must now retrace our way some distance westward until arriving at



road, which takes us south to the next of interest - Limehouse. The parish church is dedicated to St. Anne, and of the fifty brought into existence by act of 1710. The architect was Nicholas Smoor, the building being completed in 1710.

The tower is a well-known landmark, and is seen for many miles by those approaching from the river. The interior of the church is not called for special mention; the whole being treated in a plain, sensible style, but the tower, is not remarkable for grace or proportion.

The church is raised on a somewhat remarkable site which is almost important enough in its own right to form a lower church. It contains vaulted ceilings, and it may be supposed that they thus kept above ground to avoid difficulties of the adjacent river. Behind the church lies the old riverside highway called Three-Colts-lane, in which are some characteristic timbered houses.

Now Limehouse lies the Isle of Dogs, or Dog Marsh. It is supposed to have gained its name from the dogs belonging to the Duke of Greenwich being kept there. On the site there formerly stood an ancient chapel, dedicated to St. Mary, and supposed to be built for the convenience of mariners. It had been used as a farm in 1800, and disappeared when the East and West India Docks were built. It is little to detain us in the parish of Poplar. The church was built as a chapel of ease in 1650, rebuilt when the docks were made. An altar hall standing in the High-street was pulled down in 1760.

Amongst several noted residents of the parish is Sir Richard Steele, who resided here some years.

Now turn westward, and, skirting Limehouse Church and Basin, take a turning to the right which brings us into the ancient riverside of which the famous Ratcliffe Highway is a continuation. Here still remain some wooden remains of the well-known waterside type, as well as several good doorways and shop-fronts.

A few minutes we have walked into Shadwell, whose name is a corruption of St. Chad's, formerly in the churchyard. The parish separated from Stepney in 1669. The first church was burnt in 1821 when the present feeble edifice took its place. In 1749 the mineral waters were rediscovered and an attempt made to establish a spa, which, however, soon died a natural death. The edifice is very appropriately, many others hereabouts, dedicated to St. George.

After passing Shadwell the street begins to widen, and we are soon aware that we are in the district known as Wapping Stepney. St. George's parish was created in 1715, the church itself almost overshadowed the highway.

It stands well in a good piece of ground, formerly a churchyard, but now converted into a garden.

The tower is known to most of us, even to our youngest friend, and so does not need description. Those who have seen it have perhaps, the best part of the church. Here, in the earliest days of religious revival, the "surplice" riots took place. Within, the church is in its details expressive of the solemn stability of fifty years since. The exalted for the churchwardens, the crimson velvet pews, comfortable pews, queer high pulpit sounding-board, and, until lately, the singing old ladies with white caps who showed us to their seats, make a *total ensemble* which seems advanced days seems quite archaic.

A large proportion of the parish was pulled down in 1810, when the London Docks were built, and, as in parishes of similar nature, many of the better class folk have fled beyond the limits to the suburbs.

Before leaving, notice the mosaics by Salviati, the excellent decoration lately done under the superintendence of Mr. Keith Young.

On the other side of the highway Old Gravel-road runs down to the river. Near the lower end of this street, the London Docks, are the buildings of the Raine's Schools. Henry Raine, a local brewer, here founded in 1719 a school for fifty boys and fifty girls. He also devised a further scheme for educating a certain number of girls for domestic service. The scheme led the giving twice annually a wedding of 100l., which is drawn for by the girls.

This interesting charity is still administered according to the original intention, but I regret to say that a new scheme is in process of being established, and that in a few years the last dowry will have been paid.

Hard by are Wapping Old Stairs, of classic memory, and also Execution Dock, of unenviable reputation. Here, according to Stowe, were hung, in chains, all pirates brought to London, and were not removed until three tides had flowed over them.

After glancing at Wapping Church, with its picturesque-looking tower, and noting several good doorways and shop-fronts, we return to the highway and turn westwards again. Princes-square is close by on the north side. In the centre is a curious little box of a place, the Swedish Church, built in 1729; here was buried Swedenborg in 1772.

A little further on is Wellclose-square, containing the Danish Church built by C. J. Cibber in 1696, at the expense of Christian II., of Denmark; it is now the British and Foreign Sailors' Mission Church, and contains an organ which is famous.

Hard by are the St. Katherine Docks, which preserve in their name the memory of the splendid and famous buildings destroyed in their making in 1827. The charity was founded in 1148 by Matilda, wife of Stephen as a hospital for the maintenance of a master and several poor brothers and sisters. It was dissolved and refounded on a similar but improved basis by Eleanor, widow of Henry III. During the Middle Ages the foundations were several times enriched by royal gifts. In the thieving days of the Reformation it managed, partly through royal protection and partly through the spirited opposition shown by the surrounding parishioners, to escape spoliation and dissolution. In the seventeenth century, however, many of the old buildings were destroyed by fire, and in 1825 the church was pulled down to make room for the docks.

At Regent's Park, whence the hospital was removed, there is a picture preserved, taken shortly before the church was demolished. Here are also carefully preserved many interesting relics.

In the chapel at Regent's Park may be seen the fine monument of John Holland, Duke of Exeter, his Duchess, and also his sister. He fought in the wars of Henry the VI., and died in 1447. The detail is excellent, and in fine preservation. The east window, until lately, was filled with old glass brought from the destroyed church, but the subjects were not considered appropriate for their position, and in 1887 the window was removed to make way for a modern one in commemoration of Her Majesty's Jubilee. At the west end of the chapel are some of the fourteenth-century stalls, and a curious font.

The pulpit is said to have been given to the hospital in the reign of James I. The organ also removed from the old church is noted for its fine quality and the possession of a remarkable swell. In the chapter room are preserved some miserable seats, fine carvings from old choir stalls, some charming old chairs, and a most interesting chandelier of fifteenth-century date.

From St. Katherine's Docks we reach the Minories, an historic street having its north end in Aldgate, where our journey ends.

One cannot pass through without saying something about the Abbey of St. Clare, although of this important Medieval establishment only a small piece of wall remains. The Nunnery of St. Clare was founded by Edmund, Earl of Lancaster, in 1293 to accommodate some nuns imported from France by his wife Blanche, Queen of Navarre. The abbey became one of great importance during the Middle Ages, and continued until the Reformation, when it was dissolved. The abbey buildings then became the residence of many distinguished people. In 1552 Edward gave it to Henry, Duke of Suffolk, father of Lady Jane Grey, who was afterwards beheaded on Tower Hill.

Holy Trinity Church, Minories, keeps in memory two great houses, for its name is derived from the famous monastery near here, whilst the wall forming the north side is the only fragment left of the Nunnery of St. Clare.

The church is much visited on account of its interesting associations. It was one of those which escaped the Great Fire, but it was partly rebuilt in 1706. The monuments and several of the fittings are preserved from the earlier church. Here is the tomb of Legge, the favourite servant of Charles I., and of his son, the first Earl of Dartmouth. One of the monuments is specially interesting as exhibiting the arms of the Washington family. There is a pretty little Elizabethan monument under the west gallery, with a broad shelf beneath whence leaves are distributed to the poor on St. Thomas's Day. The church itself is a queer little place, lighted with a dome

in the centre. A gallery runs along the south side only, and there is a miniature choir and communion table. In the vestry there are several valuable prints of the last century showing the ruins of the demolished monastery buildings. The Plague records are also existing, in beautiful handwriting.

Here, too, is preserved in a glass box that ghastly relic, the head of the executed Duke of Suffolk, whose connexion with this spot has already been mentioned. When sealing up the vaults many years since this head was discovered caked in oak sawdust which had, by tanning the tissue, preserved it in the wonderfully perfect state in which it was found.

Mr. C. R. Ashbee, M.A., said that he felt some diffidence in speaking after the interesting paper they had just heard, but as a resident, and a neighbour of Mr. Masey in East London, he might be allowed to make some additions. He was a little troubled at Mr. Masey leaving out two things in his paper. One omission he felt, perhaps, a little personally, because it was the house in which he himself lived, but the other omission was that of the old Palace of Bromley-by-Bow, which had been destroyed by the London School Board. With regard to his own residence, Essex House, he would have been very happy to have lent Mr. Masey some slides of the interior panelling, showing the old seventeenth-century treatment of the walls and the arrangement of the rooms. In the case of the old Palace of Bromley-by-Bow, they had there, as far as London was concerned, an almost unique example of an Elizabethan or Jacobean building of the date of 1606. The building was, if not by, at least under the influence of John Thorpe, and when he compared the plans in Thorpe's book with those of the old Palace of Bromley, he found some striking similarities. The house had been altered in the early part of the eighteenth century, and cut into two, and it remained in perfect condition after the alteration, up to a month or so ago. What was peculiarly beautiful in the house was the James I. room, which was panelled throughout, and had a superb mantelpiece of carved oak and stone. There was also a magnificent plaster ceiling with the Royal Arms, and in the panels of the ceiling were the heroes of antiquity. In addition, there were some twenty-five panelled rooms in the house. The London School Board took it into their heads to buy the place, and to build a new school there, without finding out what a fine old building it was. They then parted with the house to a contractor, who sold the interior fittings to a dealer, and in the end the mantelpiece changed hands for more than half the cost of the whole house. He (the speaker) tried to save one of the fine ceilings. One morning he found a workman about to put his pick through the finest of the plaster panels, and he took upon himself to stop the hand of the destroyer. He had succeeded in preserving the finest of the ceilings, and it was now at South Kensington. With a little proper care this old building might have been applied for public purposes in Bromley, which was crying out for a library. Even had it not been possible to have so utilised it, a little care and additional expense on the part of the School Board would have made it suitable for a school, and preserved the finest portion of the seventeenth and eighteenth century work. A hint thrown out by Mr. Masey in his paper brought him to another matter. Mr. Masey said that a record should be made of works of this kind, and suggested that the Architectural Association Camera Club should assist in taking the matter up. He heartily endorsed that statement. There was an immense field open, not only for anyone who might desire to study for himself, but also to do something for the preservation of the few remaining works of past architecture left in Greater London. The suggestion tallied entirely with the circular he had drawn up, and which contained some proposals with a view of saving these old buildings of East London. It was proposed to form a Watch Committee, acting in conjunction with the Society for the Protection of Ancient Buildings, and the compilation of a register in which all work of an artistic and historic interest should be catalogued, and, in some cases, marked with a red star for possible preservation by local authorities. It was further proposed to confine the sphere of influence to radius of twenty miles east and north of Aldgate, and bounded on the south by the Thames. It should be borne in mind that the workmen's quarters were now extending well into Essex, which was one of the richest of English counties for old monuments.



He invited all those who might be willing to support the scheme to send their names to him.

Rev. J. K. Mahomed (chaplain of the London Hospital) said that it was with regret he saw the old specimens of architecture fading away, and the nice plasters and other features, when they got a little out of order, being knocked down. He was in a place the other day called the Tenter's Field, behind Butchers'-row, Aldgate, where the London Militia used to drill, and there he noticed a number of good-sized houses of the Queen Anne style. At Church-road, Limehouse, he remembered the old brick houses with pilasters, reminding one of Canaletto's pictures of Venice. Those old houses in Church-road were inhabited by well-to-do people, within living memory, and in the three end houses, a churchwarden friend of his informed him, lived a peer, a judge, and an M.P. The contrast was great nowadays, when they were occupied by several families, with their large drawing-rooms let out as factories. In Commercial-road, his medical man occupied a house, all panelled on the ground floor with beautiful mahogany, finely worked, which had belonged years ago to a sea-captain. Notwithstanding the dingy aspect of many of the bye-streets, if one knew where to go there was a great deal of interesting architectural work to be found in the East-end of London.

Mr. Fellowes Prynn, in proposing a hearty vote of thanks to Mr. Massey, said that he had given, in the first part of his paper, rather a gloomy account of East-end London, but he (the speaker) had met foreign artists who admired the effects caused by the moist atmosphere and even the smoke of the metropolis. He, himself, had often observed effects in some of the streets which were really very beautiful, and which were rather enhanced than otherwise by the murky air. Thus defective detail was often hidden, and fine effects gained by general massing and outline. But he acknowledged that this was treating the subject more from an artistic than a purely architectural point of view. As to the paper, they must all have been delighted with the way in which Mr. Massey had treated the subject, and he felt a longing to see more of the interiors of the houses, in some of which the panelling was most beautiful and well worth study. He believed, too, they would all enter thoroughly into the plan for the preservation, as far as possible, of these buildings and their details. At the same time, he thought that a slight mistake had been made in connecting it with the Society for the Protection of Ancient Buildings. That Society had stereotyped lines, which did not always coincide with the views of architects, and it would, therefore, be better to keep Mr. Ashbee's scheme separate, and rather localise it.

Mr. Ashbee explained that it would be kept quite separate.

Mr. Sedgwick, as an East Londoner, and knowing all the buildings which had been dealt with, seconded the vote of thanks. Those who were acquainted with the old Palace of Bromley would realise the great loss London had sustained in its demolition. He would be happy to join the Society Mr. Ashbee had mentioned.

Mr. Satchell said they would congratulate themselves that the London County Council—perhaps unintentionally—appeared to be on their side. He believed there was a clause in the new Act which enacted that, before any such building was pulled down, the District Surveyor should be responsible for taking a measured drawing of the front.

The President said that Mr. Massey had given them a most interesting and valuable paper, and had shown that the unenticing neighbourhood contained many buildings of great beauty and interest. Those old Dutch buildings, which for want of a better name were called Queen Anne, were in themselves extremely pleasing, while the iron work, the ceilings, and the panelling were always worth studying. Had Mr. Massey extended his survey south of the Thames, he would have found plenty of ground, equally interesting. He need not remind them, for instance, of Greenwich Hospital, and the part with which he was well acquainted, viz., Southwark and Bermondsey. In those neighbourhoods there were whole streets of beautiful Georgian houses well worth notice, which had come down in the world, and where one or two families lived in a single room, and thought themselves well able to take lodgers as well. Mr. Ashbee occupied a most beautiful old house, which he had had the pleasure of going over. The work Mr. Ashbee was carrying on in it was one of the greatest utility. In a previous session they had had the pleasure of hearing a paper by Mr. Ashbee, when he exhibited specimens of the work done in his school, and when it was remem-

bered that it embraced everything, from gold and precious stones down to furniture executed of the least costly materials, it would be seen what a wide range of subjects was dealt with. It seemed extraordinary that a comparatively well-educated body like the London School Board should not have sufficient sense to see what damage they were doing in pulling down a building which could never be replaced, and erecting there a school which, though useful in its way, might well have been built a few hundred yards off.

The vote of thanks was then put and cordially received.

Mr. Massey, in replying, said that he knew of the buildings mentioned by Mr. Ashbee, but he was aware that gentleman intended to be present, and he wished to allow him to describe the interesting palace which had been so shamefully destroyed. They were all grateful to Mr. Ashbee for rescuing some parts of the work, and it would be a good thing if other architects were as active in preserving old buildings. He was under obligation to Messrs. Beck for the loan of the "Frena" camera, with which he had taken the views.

The meeting then terminated.

#### ARCHITECTURAL ASSOCIATION SPRING VISITS: THE TOWER OF LONDON.

THE fourth Architectural Association spring visit was paid, under the guidance of Mr. Edmund Woodthorpe, M.A., on the 17th inst., to the Tower of London, when the members assembled to the number of about 100. Two parties were formed, and by the courtesy of General Milman, the Governor, were attended by special "Beefeaters." A start was made at the west entrance through the "Middle" and "Byward" Towers into the "Outer Bailey," having on the right, or river, side the "Traitors' Gateway," with low segmental arch of 64 ft. 4 in. span, and formed with joggled stones, erected in 1241 A.D., and considered a marvel of construction in those days. The "Inner Bailey" was reached through the "Bloody Tower," and vaulted archway, with its ancient portcullis and bosses, to the vaulting left open for purposes of pouring molten lead on the heads of the invaders, then, on the right, into the "Wakefield Tower," where the Crown Jewels are kept, and well worth a visit to designers in precious metals, many of the gold articles of Charles II.'s time being beautifully chased and of good outline, most of the jewels dating from this period. We now proceed up the steep and narrow stone-flagged street to the "White Tower," the famous Norman keep (107 ft. by 118 ft., and 90 ft. high) with its time-worn walls and stern battlemented parapets. Only two of the original Norman windows remain, with semi-circular arches on bed-post balusters. They are in St. John's Chapel, on the first story. The remainder were removed by Sir C. Wren, in 1663, for the insertion of larger and plainer semi-circular ones. The simple division of the interior by a wall running north and south for its whole length was noted, forming the retainers' hall, banqueting hall, &c., and reached by the turret stairs. The dungeons in the basement were then inspected, and from the prisoners' point of view contrast somewhat unfavourably with modern erections of the kind, although similar in plan to modern assize courts. The armoury was then visited and proved full of interest to modern designers in the chasing of steel, treatment of leather and equestrian accoutrements, which from an artistic point of view have sadly degenerated in these latter days.

Proceeding by the turret stairs, the St. John's Chapel (58 ft. 6 in. by 31 ft. by 32 ft. to crown of vault, the nave being 14 ft. 6 in. between pillars) is reached, which, with St. Bartholomew's, Smithfield, is the most perfect of Norman remains perhaps in England. Notice was taken of the plain Norman concrete-vaulted aisles and apsidal end and "chevet," and the varied cushion-capitals to the nave columns. The king's private entrance from his apartment on the triforium level was pointed out; while above the top of the roof is a low chamber, furnished with loopholes, to assist in the defence of the keep. The interesting Chapel of St. Peter ad Vincula, rebuilt in 1532, was next seen, and is noted more especially, as Macaulay says, for its "reception of the bleeding relics of men who have been captains of armies, leaders of parties, oracles of senates, and ornaments of courts." After visiting the "Beauchamp Tower," the party dispersed on to the Terrace-walk, from which the newly-erected Tower Bridge is well seen,

#### COMPETITIONS.

BRIDGE OVER THE RIVER DEE.—Mr. F. Fox, C.E., Westminster, to whom the Flint County Council submitted as assessor twenty designs for the proposed new bridge over Dee at Queensferry, Hawarden, has reported favour of the design signed "Verax," the author of which is Mr. F. W. Barber, C.E., Silver St. Leonard-on-Sea. The Council offered a premium for the best design. The estimated cost of the new bridge is 12,000*l*.

#### Correspondence.

To the Editor of THE BUILDER.

#### THE FELLOWSHIP ELECTION R.I.

SIR,—As one who had great pleasure in voting for three men on the list (including Mr. Batterbury) whose work I knew, may I ask your kind indulgence for a reply to his letter in your issue of this week? I agree with Mr. Batterbury that the result of the election does certainly, and seriously, damage the "prestige" of the Council, but I think that full of promise for the future of the Royal Institute of British Architects, which Mr. Batterbury allows is a wider matter.

I must, however, dissociate myself from those who have, in a wholesale manner, voted against men without possibly knowing anything of their work or against.

At the same time it must be allowed that it is as absurd, and perhaps even more detrimental to the best interests of the Royal Institute, that should vote in favour of candidates of whose fitness for the degree they know nothing.

The Council were surely not only unimpaired by their own "prestige," but also of the dignity of the Institute, when they called upon all men to vote for or against each man on the list.

But if they care thus little, we may be allowed to congratulate the Institute upon having among its rank and file men, perhaps less opulent, who have higher ideal of its duties and its possibilities.

And, Sir, one word more. Let it not be imagined that the resort to "a show of hands" will matter; the Council may have all the weight of the influence to make things uncomfortable for the critics, but the critics will be there nevertheless.

E. W. WIMPER.

SIR,—In common with many others, I am greatly disappointed at the result of the election of Fellows of the 18th inst., and that gentlemen of marked superiority and ability should be rejected in a wholesale manner. I cannot vouch for the fitness of all the candidates, but as a Birmingham man to understand upon what grounds the architect the Mason Science College, Birmingham (one of the best-arranged and handsomest buildings in the city) should be rejected. So long as the bye-laws of the Institute allow gentlemen to be candidates for the Fellowship based upon the merits of their works, without having to submit to examination, I think that the least members should before making up their minds to vote against a candidate, be allowed to ascertain what the candidates have accomplished, and not reject them without full knowledge of their merits or demerits.

WILLIAM H. ASHFORD.

#### PROPOSED EXHIBITION AT THE IMPERIAL INSTITUTE.

SIR,—There is an invitation from the Imperial Institute addressed to the "Manufacturers of Painted Glass, to exhibit their work there, during the ensuing summer.

A clause at the bottom of the opening paper "Designers may not be exhibitors." It appears that the expressions used and the terms of the exhibition are most unfortunate if a good exhibit is desired. To class the production of a painted window with *Manufactures* is hardly sensible in opinion. A single work produced by skilled labour from a design may be so classed in a crude way, it is a very design term when used to classify the work of a window and a drinking-glass. Of hundreds are produced alike, of the other, again, in all the best houses producing painted windows—the producers are artists or designers. This prevention of the exhibition of the work of designers will therefore exclude them. I do think it was the intention of the Committee to do which their terms express—namely, to invite to the exhibition (mostly foreigners) who do produce work as a manufacture—that is, that they are the employees nobody knows who as designers, and vend their works after the manner of commercial travellers.

\*\*\* The condition named by our correspondent appears to us one of the most extraordinary anachronisms we ever heard of. It is a complete retrogression in artistic exhibition.—ED.



# BOILER EXPLOSIONS.

—The leading article on "Boiler Explosions" at week's *Builder* is, in one respect, dis-  
tating. There are no particulars given, and  
more, not presumably in Mr. Fletcher's Report,  
nature of the hot-water supply where domestic  
exploded. I have a theory that the following  
"movements" conduce to frozen hot-water  
—(1) The reserve water or "cylinder" near  
boiler; with (2) a secondary flow and return;  
e expansion pipe carried through the roof;  
e constant supply.  
er expands rapidly with cold below 39 deg.,  
the above conditions, therefore, the pipes  
freeze from the "expansion" downwards.  
facts confirm this supposition?  
ch 19, 1894. FRANCIS E. JONES.  
We shall be glad if any correspondents who  
ad practical experience in the matter can give  
information on this point.—Ed.

## the Student's Column.

### THE STRUCTURE AND PHYSICAL PROPERTIES OF BUILDING STONES.—XII.

#### STRUCTURE OF ROCK MASSES.

ALL building stones found in stratified  
rocks vary in character when traced over  
a wide area. The change may be rapid  
adual, depending on locality. It may be  
stone of practically the same kind, so far  
quality for building purposes is concerned,  
occur over an area of several square miles,  
may vary every few hundred yards. Thus  
ere fact of a merchant opening a quarry  
uous with another, and which stone of proved  
ility and evenness of colour is found, is no  
e fact that the new venture will prove as  
ful. In many cases, however, it un-  
edely does so, and is always worth the  
ment. The depth from the surface at which  
stone is found is also liable to great variation,  
though in certain localities the material is  
to improve as it is dug into, this is by no  
universal, and cannot be laid down as a  
al principle.  
e reason of the variation in structure and  
osition of one and the same bed of stone,  
er in a limited space or over a wide area, is  
y not difficult to understand when we con-  
its origin. Seeing that such rocks as lime-  
and sandstone were always formed under  
e, and derive the materials of which they are  
either from the shore or from the accumu-  
of organic remains, or from mineral  
deposited chemically, the wonder is that  
the circumstances they exhibit any uni-  
ty in structure at all over a large area. For  
method of deposition must have been  
nely capricious, following the character and  
nt of material available, velocity of currents,  
a multitude of other things. We know  
tly well from what is taking place round  
hoast at the present day (which is a very  
indication of what took place in remote  
geal periods also) that the nature of the  
ent deposited at any given place is controlled  
ly by the quality of the adjacent sea cliffs.  
e these latter change in material, the  
ent, both as to kind and quantity, vary  
tingly, and dovetail one into the other.  
ay from the land, where no sediment, or  
y any, ever reaches, and the sea-floor can  
be covered by the successive accumulations  
e harder parts of marine organisms, we  
e expect to find the rocks of that origin  
uniform in character, and so they are to a  
n extent. But we must remember that in  
ajority of cases the organic remains referred  
onged to those denizens of the sea which  
either fixed to the sea-floor or crawled  
the bottom—not free swimmers—and  
distribution was, as now, exceedingly  
ical, depending on the nature of the sea-  
abundance of food and a variety of other  
stances. All these things have had their  
nce in varying the structure of shelly lime-  
s and the like.  
art, however, from their origin in the first  
ance and totally different set of causes  
since intervened and largely determined the  
mity or otherwise in quality of the stone.  
ll know that sand, accumulations of shells  
ediment generally, could not of themselves  
tude solid stone; that has been produced by  
subsequent cementing together of these  
les by chemical means, induced by the  
lation of carbonated water. Here, again,  
ve a source of variation controlled by the  
of perfection of the cementing action, and

of the quality of the cement introduced. Some-  
times the loose materials have been compacted  
together by pressure alone, especially in the for-  
mation of certain sandstones, but such rocks are  
rather the exception than the rule.  
As though the variations already produced  
were not sufficiently perplexing, we find yet  
another fundamental source of alteration. The  
mineral (usually calcite) of which the organic  
remains were originally made has in many  
instances been entirely altered through the agency  
of percolating water impregnated with carbonic  
acid—sometimes into a more durable mineral,  
but oftener into one of a less stable character.  
In other words a facsimile of the original  
remains in some other mineral is all that is now  
left. By the same subtle process non-crystalline  
mineral matter in the rock has now become  
crystalline and *vice versa*. Let not the student  
imagine that this action has produced uniform  
results throughout the stone. Here is the other  
cause of variation in structure referred to.

We now come to the point of these observa-  
tions. What with (1) the difference in the loose  
materials; (2) the different character of the  
matrix, and the distribution of the same; and  
(3) the manner and degree of the alteration  
experienced by the whole, we are presented with  
elements which enable us to distinguish with  
the various stones one from the other by examination  
with the microscope. The student, no doubt,  
prophesied this on attentively regarding the  
micro-photographs illustrated in the double plate  
of our last issue. But this principle is capable  
of much wider application than the determination  
of greatly differing classes of rock-structure; it  
may be used in detail to detect varieties of the  
of the same class of stone in divers quarries.

The structure of igneous rocks on the large  
scale is totally different to that of the sedi-  
mentary. It is true the former, like the latter,  
are permeated by joints and fissures; it is true  
also that the best known member of the group,  
from our point of view—granite—varies in struc-  
ture when traced over a wide area. But that  
variation is in general merely one of change in  
preponderance of one mineral over another, or  
the elevation of an accessory mineral into an  
essential. Where the granite joins other rocks a  
certain amount of alteration in structure is ap-  
parent, new minerals may make their appearance,  
and the whole may be greatly discoloured; but  
all these things are extremely local, and do not  
usually affect the main mass of granite as quarried,  
which, area for area, is remarkably uniform in  
character. There are no "beds," properly so  
called, in granite, although the prevalence of  
parallel joints in some instances leads the quarry-  
man to refer to the structure as bedding. In  
districts like Aberdeen the joints are usually  
closer together and more irregular than where  
the stone is coarser-grained, say, in Cornwall. The  
system of jointing in the latter county is so  
regular that the quarrying is carried on with great  
facility.

With reference to joints in aqueous rocks, an  
essential feature in their structure in large masses,  
they may be said to run perpendicular to the  
bedding planes, or obliquely to them; when the  
latter, the stone is often difficult to quarry profit-  
ably by reason of the irregularity in shape pro-  
duced. Perpendicular joints, on the other hand,  
are taken advantage of by the quarrymen in  
getting out regularly-shaped blocks. Joints vary  
in width from mere hair-like cracks to enormous  
fissures, and may be empty, or lined with  
crystals, or filled with ferruginous earth. The  
character of the stone at and near the joints may  
have suffered from its proximity, or it may not—  
depending on circumstances. "Beds" are  
horizontal joints separating one bed from the next  
and may be continuous or run "blind." Both  
joints and "beds" have been produced in the  
rock subsequent to its original formation, mostly  
on contraction on drying, or during consolidation,  
but some are veritable dislocations due to earth  
movements.

#### OOBITES.

In describing the various building stones we  
shall first deal with those found in the Oolites.  
The term "Oolites" is used here to denote the  
whole of the system called Jurassic by geologists,  
with the exception of the lowermost member—  
the Lias. The student will know sufficient of  
geology to be aware that the "Oolitic system" is  
not necessarily synonymous in meaning with the  
word "oolite." Oolite is a rock largely made up  
of rounded granules, usually carbonate of lime,  
adhering to each other, or bound together by  
some mineral matter. Such a rock is found in  
almost every division of the geological sequence,

from the Cambrian to the Pleistocene, or, in  
other words, from the oldest stratified rock to the  
youngest; indeed, it is being formed at the  
present day. It so happens that certain portions  
of the Secondary beds are largely composed of  
oolitic limestones, and by universal consent the  
section so characterised is denominated the  
Oolitic system. The following is a brief classifica-  
tion of the formations included in that system  
in this country, together with their thicknesses:—

#### Classification of the Oolitic System.

	Thickness. Feet.
Purbeckian.....	350
Portlandian.....	220
Kimeridgian.....	600
Corallian.....	250
Oxfordian.....	600
Combrash.....	40
Bradford Clay and Forest Marble.....	30
Great, or Bath Oolite.....	130
Fuller's Earth.....	150
Inferior Oolite.....	270
Total thickness.....	2,650

From these formations nearly all the free-  
stones (limestones) used in the large towns of the  
South and West of England are derived; and  
also to a more limited extent in the North and  
Midlands. But whilst all these formations are  
included in the Oolitic system, they do not all  
produce oolite, much less oolite building stone.  
Thus the Purbeckian, whilst yielding a few shelly  
limestones, some hard enough to be polished,  
gives us no oolites, except, perhaps, in one  
instance; the Portlandian, on the other hand, is  
noted for its oolite building stone, and so are  
the Great and Inferior Oolites. The Kimeridgian,  
Oxfordian, and Bradford Clay chiefly consist of  
clay, largely used in brick-making. The Coral-  
lian and Combrash yield no stones of any note in  
the South and West of England, though the  
former is very productive in that respect in East  
Yorkshire. The Forest Marble is not really rich  
in marbles, as one might at first suppose from the  
title, though here and there beds have been  
polished, especially during Mediaeval times; but  
in certain places it is quarried for paving slabs,  
road metal, &c. The Fuller's Earth is sufficiently  
described by its title.

In addition to true oolites, many of the forma-  
tions yield a variety of other limestones largely  
employed in building; but by far the greater pro-  
portion of the 2,650 ft. mentioned are clay, rag,  
impure sands, rubble, and other materials of but  
little use to the architect. For our purposes,  
therefore, we shall select certain horizons and  
districts where building stones abound, and  
describe the same irrespective of the lithological  
character of the materials concerned. In this way  
the available freestones of a district will be  
defined, no matter whether they belong to one or  
to half-a-dozen different horizons in the system.

#### GENERAL BUILDING NEWS.

COTTAGE HOMES, SHEFFIELD.—On the 3rd inst.  
the memorial stone of the headquarters of the  
Cottage Homes scheme of the Sheffield Board of  
Guardians was laid by the Chairman of the Board  
(Mr. J. Wycliffe Wilson). Entrance to the head-  
quarters is gained from Smilser-lane, and the first  
building will contain an entrance-lodge, waiting-  
rooms, medical examination-rooms, bath, super-  
intendent's office, and extensive stores, whilst there  
are to be day-room and dormitories to be used as a  
probationary home for ten boys and ten girls. There  
will also be accommodation for the foster parents.  
Beyond this building will be the laundries, the dis-  
infecting-room, and the clothes store, and a house  
for the superintendent is also being built. There  
are to be three homes here, one each for boys, girls,  
and infants. Each will have three dormitories, for  
twenty-eight beds, large kitchen, day-room, pantry,  
store-rooms, lavatories, and bath, and a sitting-  
room and two bedrooms for the foster parents. The  
hospital is to be nearer the workhouse than the  
homes, and will be connected with the general  
hospital by a covered way, allowing the same medical  
staff and nurses to act in both. This connexion  
also saves the provision of kitchens and other ad-  
ministrative offices. There will be two blocks of  
two stories arranged to make, when needed, four  
separate hospitals, each having one large and one  
small ward, a day-room for convalescents, bath-  
room, and nurse's-room. The day-room will  
open on to broad balconies. All the sleeping ap-  
artments in the homes and the hospital are provided  
with external fire-escape staircases. The total cost  
of the headquarters is about 20,000l., and it is  
hoped that the buildings will be completed by  
August. Mr. C. J. Innocent, of Sheffield, is the  
architect; Messrs. George Longden & Sons, the  
contractors; and Mr. George Malpas, the clerk of  
works.



**HOTEL BUILDINGS, CARDIFF.**—A new hotel has been erected at Cardiff on the new Corporation-road, near the bridge over the Glamorganshire Canal at the Docks. The building, which was designed by Mr. E. W. M. Corbett, has two frontages, the principal one being towards Corporation-road and the other facing westwards. On the ground floor there are two bars, having four compartments, entered from Corporation-road, while on the western side there is a luncheon-room, a bar, and bar-parlour. On the first-floor there are eight bed-rooms, a sitting-room, and a coffee-room, with lavatories, &c. On the second-floor there are seven bed-rooms and a large room in the turret chamber with the usual appointments.

**WORKMEN'S CLUB, SEAHAM HARBOUR.**—On the 16th inst. a Conservative Working Men's Club, erected by Lord Londonderry, was opened in Charles-street, Seaham Harbour. The club is two-stories high. The architect was Major Forster, of Seaham Harbour.

**NEW EMPIRE PALACE, BIRMINGHAM.**—According to the *Birmingham Gazette*, work is proceeding apace at the New Empire Palace, which is to take the place of Day's Concert Hall, in Smallbrook-street and Hurst-street. The alterations and improvements have been carried out to the designs of Mr. Frank Matcham, of London, and the work is being done by Mr. B. Whitehouse, contractor, Birmingham, under the superintendence of Mr. Alfred P. Davis, clerk of the works. Although the New Empire will be practically confined within the limits of the shell of the old Concert Hall, it will, in no sense resemble the latter. The range of shops which ran alongside the old hall in Hurst-street have been pulled down, and in their place has been erected a new elevation in red brick and cement, with cornices, mouldings, and carved work. The style of architecture is Classical, and the two end wings are carried up with pediments bearing inscriptions "Art" and "Music" respectively. The main frontage will be two stories high, surmounted with figures symbolical of theatrical art. Over the main entrance in Hurst-street is a semi-window in stained glass, fronted by a balustrading, carvings, and other ornaments, whilst a cast-iron "shelter" will be useful in inclement weather. This entrance, which gives admission to all parts of the house except the pit and gallery, will have polished mahogany doors with stained-glass mosaic windows. The doors open immediately into a vestibule, the pilasters and walls of which are to be lined with polished mahogany, the ceiling being of plastic work and the floors of tessellated pavement. On the left of the vestibule is a crush room and the entrance to the stalls. To the right is the staircase leading to the dress circle or balcony. Special entrances are provided for the pit and gallery, and numerous emergency exits for use in case of fire or panic are designed for each part of the house. The stage is divided from the auditorium by an iron fire-proof curtain and iron doors. Immediately behind the orchestra will be the stalls, and to the rear of the latter the pit with an inclined floor. On either side of the stalls are alcoves, the one on the right of the stage giving admission to the stall saloon. There is a saloon or bar for each section of the house. On either side of the stage—on a level with the dress circle which skirts the entire building—are three private boxes. Altogether there will be seating accommodation for 3,000 persons. The Empire Vaults, at the corner of the building in Hurst-street and Smallbrook-street will be pulled down and rebuilt with a new mahogany front, with pediments and balustrading over, and a base of polished granite. Inside, the place will be fitted with three private bars and a public bar. The general scheme of colour will be buff and gold. The whole of the building will be lighted by electricity, provision being made for lamps to the extent of 7,500-candle power, but gas will be laid on for cases of emergency. The hall will be heated with hot-water. The total cost of the alterations will be about 16,000l.

**THE RESTORATION OF BRISTOL CATHEDRAL.**—A meeting of the Executive Committee for the Restoration of Bristol Cathedral was held on the 14th inst. in the Chapter-room. A report from the clerk of the works showed that the central tower had been restored on all its sides up to the window heads, or nearly so, of the upper story, and within a few feet of the top; also that the stones which had formed the old parapet, with its turret object of incorporating all that were sound and suitable in the new work. It was stated that the tower would probably be completed in the early autumn, and that the Elder Lady Chapel was finished in respect of stone work, and that the wrought iron screens, the new stained glass east window, and the fittings for electric lighting would very shortly be added. The total of contributions to date was announced to be 9,307l. 8s. 6d., which would be more than exhausted by works already undertaken. At the invitation of the Dean, Mr. Riseley attended to express his opinion upon the future position of the organ. He strongly recommended its being placed over the choir screen. This, however, was felt to be incompatible with the arrangements proposed by the architect, Mr. Pearson, from whom a letter was read expressing

disagreement with such a course. It was pointed out that such a position for the organ would to some extent obscure the east window and other architectural features of the building, especially to anyone entering the nave from the west. The Dean expressed an earnest hope that a solution of the difficulty might be found in the provision of a new organ at the west end of the nave, and the retention of the present organ in the north aisle of the choir. It was accordingly agreed that estimates should be obtained for a west-end organ. The plans of Mr. Pearson for the reconstruction of the stalls were then sanctioned, and it was resolved to invite certain Bristol firms to tender for the work. It was announced that the new flooring of the choir was well advanced, and a discussion then followed as to what portions of the restoration might next be undertaken. The Archdeacon drew attention to the decayed and crumbling condition of the exterior fabric at the south-eastern side of the choir, and especially of the parapet and pinnacles adjacent to Berkeley chapel. He suggested that an appeal should be made to restore these portions, to reconstruct the choir organ, and also for such of the items mentioned in the original circular as were not yet provided for. These would include a new choir screen (in place of the unsuitable one which now separated choir from nave), side screens, communion rails, and a reredos. It was resolved that a vigorous appeal should be made for these objects, and that the architect should be asked to prepare drawings, which might be placed in the Cathedral for the inspection of those interested in the restoration, who might thus be encouraged to make special offerings for different sections of the work.

#### SANITARY AND ENGINEERING NEWS.

**IMPROVEMENTS IN SOME CITY PREMISES.**—The establishment of Messrs. Vyse, Sons, & Co., in Wood-street, is in process of sanitary reconstruction under the superintendence of Messrs. Tillett & Yeoman, architects and surveyors, of Newcastle. Messrs. Tylor & Sons "Tower" pattern, have been introduced; enamelled pipes channels and bends by Messrs. Winsors, and glazed earthenware pipes by Messrs. Doulton, have been put in. Mr. R. E. Clarke is the builder.

**SEWERAGE SCHEME, POCKLINGTON, YORKSHIRE.**—The Pocklington Local Board have instructed Mr. D. Balfour, M.Inst.C.E., F.G.S., of Newcastle-on-Tyne, to prepare a complete scheme of main sewerage and sewage disposal for the town.

**NORTH BRIDGE SCHEME, EDINBURGH.**—The Town Council of Edinburgh held a special meeting on the 16th inst. to consider an interim report by the Lord Provost's Committee on the North Bridge scheme and negotiations with the North British Railway. The report stated that the North Bridge was founded in 1763, and that though it is structurally sound, and the footpaths on it were widened only about twenty years ago, the question of widening or rebuilding it would in any case arise in the future, which the Committee believe cannot be very distant. The railway company are now about to proceed with the extension and remodelling of the station, and this compels the Corporation to deal at once with the question of widening or rebuilding the North Bridge. The cost of rebuilding the bridge is estimated at 90,000l., and two plans have been submitted between Sir William Arrol and Mr. B. Hall Blyth, C.E., the company's engineer, either of which the railway company is willing to agree to. The alterations open to the Corporation are (1) to allow the bridge to stand as it is, or (2) to take advantage of the present opportunity and go on with a scheme for a new bridge, provided the company pay such a contribution and agree to such terms as shall be satisfactory to the Town Council. If the first alternative is adopted, the new station buildings, it is planned to suit the new bridge, to be accommodated to the existing piers of the bridge, which would not merely hamper the company in the course of the work, but would prevent them from making the station arrangements so convenient as would otherwise be done. Then, when the Corporation at some future time wished to rebuild the bridge, they would get no contribution from the railway company, and otherwise much difficulty and expense might be entailed. In the event of the second alternative being accepted, a large contribution would be got from the railway company towards the cost, and the work would be carried on concurrently with the reconstruction of the Waverley Station, and the company would co-operate and adjust the station plans to suit the new bridge. The Committee had discussed the question of the effect of the alterations on the depth of the valley and on the view of the bridge, and mentioned in this connexion that since 1861 the height of the station floors between the North Bridge and the Waverley Bridge has been raised from 30 ft. to 42 ft. above the level of the sea. The company now seek power to erect station buildings east of the North Bridge to same height. The company offer a contribution of 30,000l. towards the cost of a new bridge of the width of 75 ft., under certain conditions, two of which the Lord Provost's Committee say they cannot agree to. The first of these is that the Corporation should give up the rent of 125l. per annum at present paid by the company for the arches under

the North Bridge. This, the Committee point out, would be equivalent to a payment by the Corporation to the company of 4,766l. 6s. 8d., and be practically a rebate to that amount on the contribution of 30,000l. The second condition is that the railway company desire the Corporation to them a servitude against any building upon the Waverley Market, but the Committee decline to entertain this as part of the present negotiations. The company, in view of this, do not undertake to take down and rebuild the present proper Princes-street next to the Waverley station, but stipulate that if they do take them down, they shall be entitled to rebuild to a height of from the level of the roadway in Princes-street to the ceiling of the topmost room. The Corporation were allowed they would throw into pavement the present open area in Princes-street. Regarding the widening of North Bridge, the desirableness of this being done to the width of new bridge, 75 ft., was pointed out by the Committee. For the information of the Council, an estimate of the cost of this work has been submitted by Messrs. Thomas Lang, Borough Assessor; W. Ormiston, surveyor and valuator; and David Ormiston, builder and valuator. These gentlemen state in their opinion the final cost (after reimbursement from sales) of widening both sides of street between North Bridge and High-street, assuming that the Corporation carried out the work, would be 100,000l. The following amendments were agreed to. That the Council remit to the Lord Provost's Committee with the following instructions, viz. (1) To decline to agree to the North British Railway Company's proposal that the rent of 125l. per annum for arches at the North Bridge should be paid up as part of the arrangements for a new bridge. (2) To decline to consent to the buildings in Princes-street between the Waverley steps and the North Bridge being raised to more than 60 ft. in height above the level of the street, unless on a proposal by the Railway Company to take down the present buildings, and rebuild them within five years of this date, according to a design to be approved by the Corporation; and in the event of such a proposal being made, the matter to be again brought before the Council for decision as to what in height, if any, shall be allowed, and on what conditions. (3) To proceed with the Corporation's Bill for the improvement of the North Bridge and North Bridge-street for other purposes, at present before Parliament. (4) To bring the negotiations for an agreement between the Corporation and the Railway Company to a conclusion, and to submit to the Council such a point as to admit of the result being submitted to the Council for approval, if so advised as early a date as possible.

#### STAINED GLASS AND DECORATION.

**REDECORATION OF THE LEEDS TOWN HALL.**—At a meeting of the Corporate Property Committee of the Leeds Corporation on the 16th inst. tenders for the redecoration of the Town Hall were considered. Originally nine tenders were received, but these had been reduced to two, and the committee had to decide between the respective offers of Messrs. Dobie & Son, of Edinburgh, who were prepared to do the work for 1,910l. 18s. 6d., and Messrs. Crace & Son, London, whose tender was 2,590l. After considerable discussion the latter was accepted.

**WINDOW, ST. AUGUSTINE'S CHURCH, HALIFAX.**—A stained-glass window has just been placed in the chancel of St. Augustine's Church, Halifax, in memory of the late Mr. H. H. Simpson, a prominent chief figure in the window is Our Lord as the Shepherd, bearing a lamb, as if carrying it in his fold, and with sheep around him looking up listening. The window is from the studio of Mr. Powell Brothers, of Leeds.

#### FOREIGN AND COLONIAL.

**FRANCE.**—Parliament has authorised the Caisse de Paris to contract a loan of 200 millions francs applied to the execution of some important improvements. To this sum will be added 20 millions necessary for the purification of the Seine. The Government has suppressed an unnecessary post of "Commissaire-Général des Expositions Françaises à l'Etranger," which held by M. Roger Ballu. M. François Flah has been commissioned to paint the portrait of the Empress of Russia and that of the Grande Duchesse Hélène. At the Académie des Beaux-Arts the following gentlemen have been admitted to the competition for the Prix de Rome in the section of architecture:—MM. Varcollier, Depierre, Recumbdenstock, Héraud, Lecardonnell, Du Patouillard, Tony Garner, and Chiffot. The subject is a design for a Palace for the Institut. The "Société du Souvenir Français" proposes to raise, at the "rond-point" of the Avenue de Breteuil, a monument to the memory of soldiers of the Colonial army who have died in the service of France. The execution of the monument has been entrusted to M. Gaudet, the sculptor. An impressionist painter Caillebotte, whose death was recently announced, has left to the Luxembourg



MARCH 12. — By A. Richards: The residence "Stone Hall," High-st., Wandstead, f. 701, 702; "Mount Pleasant," f. 800<sup>1</sup>, a block of f. properly, two houses and cottage, r. 854, 1,605<sup>1</sup>; 31, 32, Rochester-sq., Camden-rd., u.s. 52 yrs., q. 121. 108, r. 851, 600<sup>1</sup>; "The Cottage," Snarebrook, u.s. 52 yrs. f. 301, 602. — By Wagstaff & Wharman: 46, 48, 50, Southerton-rd., Hammersmith, f. 75 yrs., q. 108, 530<sup>1</sup>, 531<sup>1</sup>, 532<sup>1</sup>, 533<sup>1</sup>, 534<sup>1</sup>, 535<sup>1</sup>, 536<sup>1</sup>, 537<sup>1</sup>, 538<sup>1</sup>, 539<sup>1</sup>, 540<sup>1</sup>, 541<sup>1</sup>, 542<sup>1</sup>, 543<sup>1</sup>, 544<sup>1</sup>, 545<sup>1</sup>, 546<sup>1</sup>, 547<sup>1</sup>, 548<sup>1</sup>, 549<sup>1</sup>, 550<sup>1</sup>, 551<sup>1</sup>, 552<sup>1</sup>, 553<sup>1</sup>, 554<sup>1</sup>, 555<sup>1</sup>, 556<sup>1</sup>, 557<sup>1</sup>, 558<sup>1</sup>, 559<sup>1</sup>, 560<sup>1</sup>, 561<sup>1</sup>, 562<sup>1</sup>, 563<sup>1</sup>, 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622<sup>1</sup>, 623<sup>1</sup>, 624<sup>1</sup>, 625<sup>1</sup>, 626<sup>1</sup>, 627<sup>1</sup>, 628<sup>1</sup>, 629<sup>1</sup>, 630<sup>1</sup>, 631<sup>1</sup>, 632<sup>1</sup>, 633<sup>1</sup>, 634<sup>1</sup>, 635<sup>1</sup>, 636<sup>1</sup>, 637<sup>1</sup>, 638<sup>1</sup>, 639<sup>1</sup>, 640<sup>1</sup>, 641<sup>1</sup>, 642<sup>1</sup>, 643<sup>1</sup>, 644<sup>1</sup>, 645<sup>1</sup>, 646<sup>1</sup>, 647<sup>1</sup>, 648<sup>1</sup>, 649<sup>1</sup>, 650<sup>1</sup>, 651<sup>1</sup>, 652<sup>1</sup>, 653<sup>1</sup>, 654<sup>1</sup>, 655<sup>1</sup>, 656<sup>1</sup>, 657<sup>1</sup>, 658<sup>1</sup>, 659<sup>1</sup>, 660<sup>1</sup>, 661<sup>1</sup>, 662<sup>1</sup>, 663<sup>1</sup>, 664<sup>1</sup>, 665<sup>1</sup>, 666<sup>1</sup>, 667<sup>1</sup>, 668<sup>1</sup>, 669<sup>1</sup>, 670<sup>1</sup>, 671<sup>1</sup>, 672<sup>1</sup>, 673<sup>1</sup>, 674<sup>1</sup>, 675<sup>1</sup>, 676<sup>1</sup>, 677<sup>1</sup>, 678<sup>1</sup>, 679<sup>1</sup>, 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### CONTRACTS—Continued

Those marked with an Asterisk (\*) are advertised in this number. Competitions, p. iv. Contracts, pp. iv., vi., and viii. Public Appointments, pp. xviii. and

Alexander Gail, contractor.....	2,16,765	13	7
Contract No. 2.			
Laidlaw & Son .....	1,021	12	2
Contract No. 3.			
Glenfield Company, Limited.....	381	3	3

WESTGATE-ON-SEA.—Accepted for alterations and addition, "The Station Hotel," Westgate-on-Sea, Kent, for Mr. J. Healing, Mr. William J. Ingram, architect, 44, Theobald's-road, Bedford-row, W.C. :—  
W. Weston ..... £5,230 0





# The Builder.

VOL. LXVI. No. 2655.

MARCH 31, 1894.

## ILLUSTRATIONS.

Chimney-piece in Ball-room, Knole House .....	Double-Page Ink-Photo.
Principal and West Fronts and North Porch, Audley End .....	Two Single-Page Ink-Photos.
The Great Hall and Fireplace, Audley End .....	Two Single-Page Ink-Photos.
Details of Metal Work, Tullie House, Carlisle .....	Double-Page Photo-Litho.

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## Examples of English Renaissance Architecture.

In the appearance of the first portion of Mr. Gotch's book on the "Architecture of the Renaissance in England," three years ago, we devoted some little space to a consideration of the special qualities of the school of architecture illustrated, as well as to the scope and character of the publication itself. The work is now complete in six parts,\* and forms a very beautiful collection of picturesque illustrations of this school of architecture, chiefly from the great mansions of which so many were erected in England in that period, which may indeed be called the mansion-building period of English architecture. And though we cannot regard a series of photographic representations as of the same value to architects as a series of measured drawings, we are glad to recognise that in the later parts of the book there has been more attention bestowed on giving plans of the buildings illustrated, a feature which was very deficient in the earlier portion of the work. It is true that the plans given are not on a very large scale or very complete in detail; but we may presume that there is considerable difficulty in obtaining adequate plans of buildings of this class. To be done thoroughly many of them would have to be surveyed afresh, and many owners of mansions in constant occupation would find it convenient to give opportunity for the necessary measurements, even if they might not object, on other various grounds, to the publication of the plans of their houses in detail. We must be grateful to the author for what he has been able to give us, although the book may perhaps be regarded in some respects as an album for a general library rather than in a special sense an architect's book.

The most distinctive architectural quality of the English Renaissance house may be said to be its combination of dignity with a certain picturesqueness of character; two elements in architectural expression which are not very often found together. Stately and symmetrical buildings are often some-

what devoid of character. The union of the two elements in English Renaissance is partly to be traced to the survival of a good deal of the spirit of Mediaeval architecture amid the forms and details of the new style. It is far less correct and classical in spirit than Italian architecture of the same period; it is more akin to the French style connected for all time with the name of Francis I., with less of richness but more of playfulness and variety. No example could represent the characteristics of the style in a more typical manner than Kirby Hall, which commences Part III. of Mr. Gotch's work. No building has more fascinated the architectural student of to-day; there are few who have not at one time or another sketched it. Its strongly defined character is one of its principal charms. There is nothing commonplace or mediocre in the architectural treatment; there is an amplitude and breadth of design about it everywhere. The immense mullioned windows towards the courtyard give it a remarkably palatial and stately expression, and this portion of its architecture is peculiarly interesting also from the boldness in which the Classic order has been treated in a manner which is nevertheless essentially Gothic in feeling and reminiscence. The Classic entablature seems to be represented only by the architrave with a rather unusually bold tenia; for although the face below this moulding is treated decoratively as if it were regarded as a frieze, the whole height of this portion is, in proportion to the scale of the pilasters, only about what would usually be given to the architrave, and above it is only a balustrade wall (not pierced), which seems to play the part of the attic. Hence the pilasters, of considerable projection, appear somewhat like Gothic buttresses, which is really the part they play in the construction, strengthening the piers between the very large mullioned windows. There is no more interesting instance in architecture of this application of Classic detail in an essentially Gothic manner; and it is a curious instance of the whirling of things in architectural history that this treatment of the pilaster as a buttress, in the sixteenth century, is so exceedingly similar to the application of the pilaster which is found in some Romanesque work, before the Gothic buttress had come into being at all.

Mr. Gotch gives John Thorpe's plan of Kirby, and the plan as existing; the buildings in both being carried round an oblong courtyard, but with the difference that whereas Thorpe's plan shows the sides of the courtyard parallel, in the existing plan one of the long sides is distinctly oblique

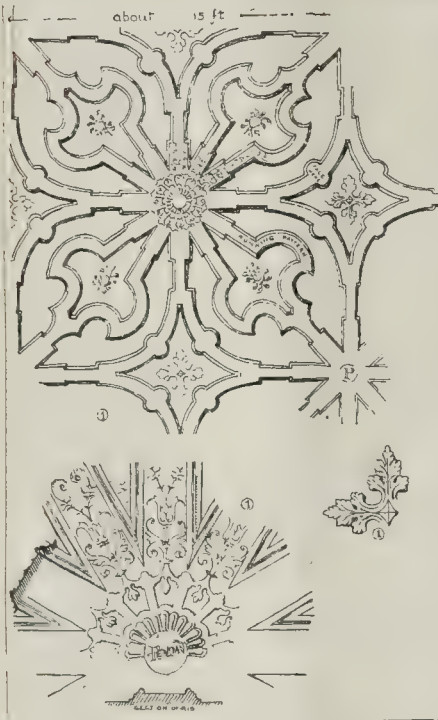
in line, the courtyard narrowing from the front to the back. The author does not offer any suggestion as to this departure in fact from the parallel lines of Thorpe's plan. The discrepancy is too great to be accounted for by careless setting out; it would seem as if, after the general scheme was settled on the ground, more space was desired in the front wing, and possibly some local circumstances hindered the proportionate widening of the opposite side of the court. It is melancholy that this fine house should have been dismantled, though one is glad to learn that the present owner is taking every care of the remains against further decay or dilapidation. A sheet of measured details is added to the photographic illustrations. The section of the plinth moulding has a curiously fourteenth-century appearance.

Of Rushton Hall, which comes next, Mr. Gotch remarks that "for simplicity of design combined with stateliness of effect" it bears away the palm among buildings of this period. We hardly think "stateliness" is an expression which properly describes Rushton; it is rather a symmetrical picturesqueness, if one may combine the two ideas. The most notable point about it architecturally is the treatment of the front of the quadrangle as a corridor of one story only, the strongly-marked horizontal lines of which contrast admirably with the more vertical character of the main building, while the arrangement is both sanitary (in regard to affording more circulation of air within the quadrangle) and architecturally effective. In fact, it may be doubted whether, on the former ground, the courtyard of a quadrangle-house ought to be closed in any other manner than this.

Part III. includes also Audley End, to which, however, only one plate is devoted, though some details occur, with other similar work, on another plate. We can supplement this with various views of the house published in the present issue (see lithographs). Mr. Gotch gives the original plan from Thorpe. As it now stands the house, as shown in our view of the "west front," is a centre block with two return wings symmetrical in treatment as far as they can be seen together, though the outer façades of the wings are treated differently. For although these wings were originally connected by a return across the front, the outer façade of the left-hand wing is, and apparently always was, the principal or show front of the house. One of the two double-storied porches is shown in one of our illustrations; this, which is the best feature in the exterior of the house, is the subject of the illustration in Mr. Gotch's collection. But Audley End

\* Architecture of the Renaissance in England, illustrated by a series of views and details from buildings erected between the years 1560-1630, with historical and critical text. By J. Alfred Gotch, F.S.A., F.R.I.B.A., assisted by Talbot Brown, A.R.I.B.A. London: E. T. Batsford, 91-1894.





Ceilings, Audley End.

was originally a much larger and more imposing house than the existing portion gives an idea of. Thorpe's plan, given by Mr. Gotch, shows a great square courtyard surrounded by buildings, in the rear of and somewhat wider than the present house. The buildings were narrower than the remaining front blocks, but according to Thorpe's plan there was an open colonnade or arcade down the two opposite sides. This portion of the building was taken down, either in 1700 or 1749, according to different authorities; probably, we may assume, because the then owners found the house too large for them to keep up. The present house, therefore, represents less than half, though probably the most stately half, of the original building. Mr. Gotch quotes Evelyn's enthusiastic account of the mansion when in its entirety. "It is a mixt fabric 'twixt antiq and modern," he says, "but observable from its being compleatly finish'd, and without comparison is one of the stateliest palaces in the kingdom. It consists of two courts, the first very large, wing'd with cloisters." It should seem from this, that the court which has been destroyed was then regarded as the entrance court of the house, and that what is now the front was then the back, or Evelyn would not have spoken of it as the "first court." He mentions that the balustrade was then composed, like those still existing on some other houses of the period, of "a bordure of capital letters"; this, as will be seen from the illustrations, is now gone, and replaced by a balustrade of the more ordinary kind. Probably the "letters" became weatherworn and damaged, and the taste for that style of balustrade having gone out, were replaced by the present one.

Stately as Audley End unquestionably is, even in its present aspect, it is somewhat cold and formal externally in comparison with many other mansions of the period. It wants the character derived from the bold and original treatment of the windows which we find in some other examples; they are regularly spaced in a somewhat tame manner and not architecturally grouped, though the

effect of the two great projecting bays at the ends of the wings is fine. Internally, however, its decoration is of the best character of the period; rich and sumptuous, yet for the most part refined and graceful. The timber roof of the great hall, shown in one of our illustrations, is somewhat ragged and fussy in outline, but the fireplace represents the best art of the day in this kind of work (see illustration), in spite of the defect of the rather weak and broken-backed scrolls on either side of the over-mantel. Some of the ceiling designs are very fine; two of them are illustrated in the annexed cuts, slightly reduced from a sheet of details of this class in Mr. Gotch's book.

Among the fireplace decorations which form prominent and striking features in these houses, that of the ball-room at Knole House is one of the most effective plates in Mr. Gotch's collection, and we have, by permission of the publisher, reproduced it as a lithograph in the present number. Perhaps the author is not wrong in his remark that the fireplaces at Knole seem less indigenous, and have more the look of having been transported bodily from some other site, than in some other cases in which they are more obviously designed for their place; and Mr. Gotch's criticism is just also in regard to the fact that, in both this and another chimney-piece in the same house of which he gives an illustration, the elaborate decoration of the over-mantel seems to form a frame for nothing, except a marble panel. There may, however, have been an intention of eventually occupying this space with something worthy of the frame, in the shape of a bust or a bas-relief, when it could be procured. We should not see any reason to suppose that this chimney-piece was not English work; indeed there are details in it which are strikingly similar to those of the Paston monument in North Walsham Church, illustrated in our pages under date August 31, 1889; the festooned knots of flowers and ribbons, the coupled Ionic columns with marble shafts, might almost have been from the same hand.

It is disappointing that a plan so remark-

ably suggestive as that of Westwood House—a central block with four wings projecting from the angles obliquely (the wings are an afterthought, much later than the centre), should not have led to a fine architectural treatment; but Mr. Gotch chronicles and illustrates the porch, a spacious and stately one with a Corinthian order of rather conventional type, as the only portion of it worth attention. There is something to be said as to the possibilities of symmetrical devices of this kind in planning, in the case of mansions of the first order, in which stateliness and strictly-observed symmetry of plan are not out of place. The difficulty, of course, is to combine such generally symmetrical lines of plan with a convenient interior arrangement; but certainly one cannot help thinking that the types of mansion plan are not by any means exhausted. We fully share the author's enthusiasm as to Canons Ashby, the drawing-room of which he gives; the columnar chimney-piece here is one of the most charming examples of its kind to be met with anywhere, although it may be critically objected that the central coupled columns in the over-mantel design seem to sit rather heavily on the light mouldings of the fireplace architrave beneath them, and to require more support, architecturally even; that they have required it structurally shown by the manner in which the architrave has cracked and dropped in the centre. The rich ceiling with its large panelling has a very fine effect as a whole; the false note lies in the too naturalistic treatment of the large thistle-sprays; an object-lesson on things to avoid in this kind of work.

In Part V, we have in the front of Fountain's Hall one of the most picturesque bits in the book, showing how much effect can be got by the mere disposition of walls and windows. The centre portion of the ground floor is slightly set back from the wings, the upper story set back a good deal further, with a large window on either side and a tall narrow semi-circular bay in the centre, projecting on to the flat left above the ground story. Nothing can be more picturesque than this simple incident of the central half-round window; it is this happy fancy of the architect which gives all the character to the front, all the details of which are as simple as possible. The setting back of the upper story of the centre arises naturally out of the plan, in which, owing to the difference of level in the ground



at front and rear, the hall has to be reached by a staircase parallel with the front wall, after the front door is entered; the piers which separate this staircase from the hall carry the upper external wall.\* Burton Agnes Hall, Yorkshire, another building of simple detail but of great picturesqueness, looks, as the author observes, like a brick building astray in a stone country. Here the wings project boldly and are finished by semicircular projecting bays with a very picturesque arrangement of windows; while, as a foil to these, the line of the recessed front is broken by two square projections, the entrance being in the side of one of these; and this side is emphasised by the introduction of a small order on each story, a feature which would seem eccentric in its position but for the motive given to it, of marking the point of entrance. The staircase at Burton Agnes, a remarkably rich erection of carved standards and string-boards, is the subject of a separate plate. A very fine illustration of the interior of Middle Temple Hall is another of the treasures of Part V., which includes also five fine plates of different patrons of Hatfield House. Here, in contrast with some of the preceding illustrations, we see what can be accomplished by lavishness of decorative detail, not indeed of a very pure order, but exceedingly effective *en masse*.

Cambridge and Oxford furnish a considerable proportion of the illustrations in the sixth and concluding part of the work, with some miscellaneous buildings of minor interest, and the whole concludes worthily with two plates of Wollaton Hall, a general view, and a portion of the north front given on such a scale as allows the character of the detail to be studied. This detail is not all in the best taste; there is too square and hard a character about it, and the projecting quoins which form bands round the middle of the pilasters are ugly when regarded as detail, though they perhaps help the effect of richness and multiplicity of the whole. It is as a whole, indeed, that Wollaton must be judged; its detail is unsatisfactory, but the total effect is superb, and all the more effective from the remarkable preservation of the stonework. As the author observes, the strict symmetry of the plan has rendered it difficult to secure convenient disposition for the practical interior services of the house.

It would have been convenient if the county or neighbourhood to which each building belongs had been inserted in the title of the plate, as well as in the letter-press, which is necessarily separated from the plates.

As a whole, this is a collection of illustrations for which we ought to be exceedingly grateful to the author. It is an endless pleasure to turn over these representations of houses of so fine a period of our national architecture; for national it essentially is in its feeling and in many of its details, although derived indirectly from Italian sources. It may furnish many a hint to the modern architect, and its appearance could not have been more appropriate than at a time when the interest in this school of architecture has so remarkably revived. Still, bearing in mind the lesson of Professor Aitchison's recent lectures on the "Advancement of Architecture," we will hope it may be used for study, suggestion, and further development, rather than for mere imitation or reproduction.

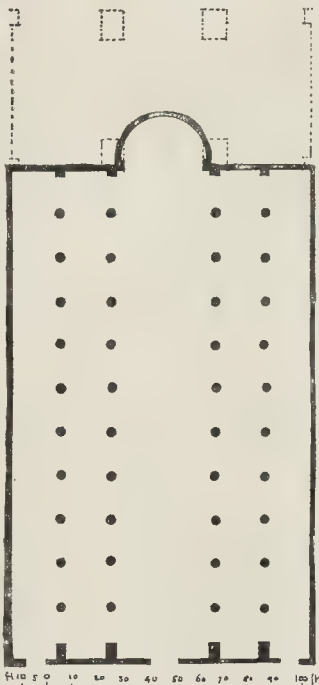
#### THE CHURCH OF ST. JOHN AT DAMASCUS.

By MR. R. PHÉNIX SPIERS.

**H**EN, at somewhat short notice, I wrote the description to accompany the reproduction of my drawing of the interior of the Great Mosque at Damascus, I was under the impression that the great transept was portion of the original church erected by Arcadius. Subsequently, on trying to work out the plan of the dome (incorrectly shown in published plans), I came to the conclusion

that it was a portion of the additions to the church made by the Shereef Walid in 705 A.D.; firstly: because the arch on the left of drawing seemed to be the natural termination of the nave, excepting the apse; secondly: because, as suggested by Mr. Lethaby, in his interesting contribution of March 17, a transept of so great a width, viz., 14 ft. wider than the nave, would be unparalleled,\* and, thirdly, because the peculiar and irregular arrangement of the arches of the nave and transepts seemed to have been motivated by their addition to a previously existing building.

Mr. Lethaby is of opinion that the transept was the original church, to which, contrary to the almost inevitable rule of all Early Christian churches, he is obliged to give an axis running north and south. From want of further information, which I hope to obtain shortly, I have been unable to complete a general plan I am preparing of the mosque and its surroundings; but Mr. Lethaby's description of the mosque and its court will render clear the further suggestions I have to make. I enclose a plan which I have prepared, since reading



Mr. Lethaby's article, in order to meet some of the arguments which he puts forward in favour of his restoration. For the moment it is immaterial whether the apse shown is at the east or west end of the church. The west was the correct site, and if, as I suppose, the church was built in imitation of Constantine's great basilica in front of the Holy Sepulchre (destroyed by Chosroes in 614 A.D.) that should have been its original position. The whole length of the church from the east or west wall to the back of the apse would have been 212 ft. The probable length of Constantine's basilica at Jerusalem also, to the back of the apse, was about 240 ft. The width of the Damascus church was 118 ft., that of the nave 40 ft., of the Jerusalem church 108 ft., the nave being probably 48 ft. Let us, however, take some other examples. St. Demetrius, Thessalonica was 155 ft. long and 103 ft. wide, with a nave 41 ft. wide (in all cases taken centre to centre of columns). Eski Djouma, also in

\* The transept of St. Paolo Fuori-le-Mura, Rome, is of the same width as the nave thereof, viz., 80 ft.

Thessalonica, 145 ft. long, 95 ft. wide, nave 48 ft. The church at Bethlehem (exclusive of the apse rebuilt by Justinian), 116 ft., width 107 ft., nave 44 ft. Of western churches, St. Apollinare-in-classe, Ravenna, was 180 ft. long, 100 ft. wide, nave 50 ft.; St. Peter's at Rome, 278 ft. long (exclusive of transept and apse) width 204 ft., nave 80 ft.; and St. Paolo Fuori-le-Mura, Rome, also exclusive of transept and apse, 280 ft. long, 186 ft. wide, nave 80 ft. There is not, therefore, so great a difference in the dimensions as to make the church I propose (without the transept) unreasonable when the great importance of the city of Damascus is taken into consideration. Of the churches above named, Constantine's basilica (according to Eusebius), the church at Bethlehem, St. Demetrius at Thessalonica, and St. Peter's and St. Paolo fuori-le-Mura, Rome, all had double aisles on each side. In order to meet Mr. Lethaby's objection to "three equal spans in a basilica nave," and also because there would be a fair probability of double aisles having been adopted in Arcadius' church, I have shown another row of columns down each of the aisles. When the Shereef Walid built the transept and doubled the length of the church, I suggest that he unroofed these aisles, took away all the columns, and transplanted them to the eastern (or western) half of the church, whichever it might be. This would account for the singular fact that the columns are all of the same length, and the capitals of the same style on both sides. (3) There are no women's galleries in the church at Bethlehem; perhaps with outer aisles the women were allotted this part of the church. (6) The east and west windows of the dome are not blocked up by the roofs of the east and west wings, as they are at a much lower level than the transept, and the roofs of the north and south transepts have been raised at a later date; the original pediment above the north transept still exists. (7) The fountain in the court is Saracenic; (8) and (10) are in favour of Mr. Lethaby's view, unless the north wall was rebuilt with arches open to the court; as the Mosque of El Aksa at Jerusalem and the other suggestions are answered by the theory I now venture to put forward.

Mr. Lethaby points out that the niches pendentives resemble features in the church in Isauria, where the dome no longer exists; the rectangular space there vaulted, however, was only 22 ft. by 20 ft. The central transept walls of Damascus are 45 ft. square, and I doubt very much whether at this early period the Byzantine builders were capable of erecting so large a dome as this. I see no reason why the actual dome should not have been the original one erected by the Shereef Walid. Pendentives, gallery round, and dome all seem to me to be of the same period. The type of pendentive adopted in the Church at Isauria is to be found in other Greek churches down to the twelfth century, and it formed the favourite feature in the churches of the South of France, at Le Puy—St. Martin d'Ainsa at Lyons, and, in another form, at Riom. It was therefore a well-known expedient for centuries, and some of the 1,200 workmen imported from Constantinople by the Shereef Walid to build his church are likely to have been acquainted with it.

The remains of the south wall of the cella of the ancient Roman temple are shown on Mr. Lethaby's plan, and it is singular that both here and at Palmyra the temple ran north and south, and was not situated in the centre of the great temenos which surrounded it. Neither the foundation-walls of the cella or of the peristyle which probably surrounded it appear to have been utilised in Arcadius's church. On the supposition that Arcadius decided that this church should lie in the axis of the great court (which on the north side is represented by the existing cloister), Mr. Lethaby's theory would account for their not being used, but on the other hand, if the apse of the church I suggest were at the eastern end it would not have



interfered with the temple, which at that time may still have been in existence. I am afraid that my suggestion as to the transept has misled Mr. Lethaby, but I am not sorry, because it has led to a most ingenious theory on his part, and I know he prefers archaeological games to those of chess, backgammon, or even draughts. R. P. S.

## NOTES.



ORD ROSEBERY'S speech last week on the occasion of a presentation to him of an address of congratulation by the London County Council, was an interesting and clever piece of work. It was a eulogium of the work of the Council, and the speaker was careful to place work attempted but not yet done on the same footing as if it had been attained. Thus the Council were congratulated on their schemes for Betterment and the taxation of ground values. When good intentions are counted as good deeds there are few corporate bodies and few individuals of whom an accomplished and tactful orator cannot say some very pleasant and apparently truthful things. But what has been done in the way of administration by the Council is not a subject for great praise; it is the first business of such a body to administer the local affairs of the Metropolis in a manner satisfactory to the inhabitants of London. It may be admitted that much of their administrative work has been fairly well performed, but analogous work is equally well done by the corporations of the great provincial towns without any flourish of trumpets. On the other hand, the Council have, unfortunately, over and over again shown in some respects, and chiefly in connexion with questions of principle, a great absence of business instinct and of tact. It is admirable of Lord Rosebery to endeavour to elevate the tone of local patriotism, and to try to instil a broad spirit into the administration of local affairs. But we could have wished that he had been last week more a critic than a eulogist. His position enables him to tell home truths to the Council; instead, he sent them away conscious that they had great duties to perform, and fully satisfied that they were the men to do them, and without any doubt of their own capacity.

THE completion of the decoration of the Conservative Club in St. James's-street has lately been taken in hand. The building was erected in 1842 by Messrs. Smirke & Bassavi, and contains some fine and well-proportioned rooms. A feature of them is the central hall, square on plan, running through two stories, and lit by a circular lantern, communication on the first floor being obtained by means of a circular projecting landing, balustraded. The original scheme of decoration was commenced in 1845 by Mr. Frederic Sang, when the upper part of the central hall, described above, along with the coved ceiling, was decorated in a style which was called "Raffaelsque," but which will be better understood by our readers as "Modern Italian." The committee being desirous of re-decorating the lower portion on the ground floor, this was effected a short time since by casing the walls with white marble, some coloured marbles being introduced in the balustrades and panels of the grand staircase which leads to it. This was executed by Italians, under the direction of a London firm of upholsterers, and seems to have caused some dissatisfaction to the members on account of its faulty execution. The general body of members, however, objected most strongly to the cold appearance of the white marble facing in the hall, and so they again employed the original artist, who has prepared and (assisted by his son) carried out a scheme in which the marble work has been "roughed up" (so that colour will adhere to it) and painted over in the same style as the upper portion! In other words, the marble has been made to look like plaster, portions

of the marble architrave being gilded. The decorations are carried out by artists from Munich, and will be understood when we say that greens, blues, reds, and yellows of a muddy hue, in which combinations of female figures in frames, portraits (supposed) of poets and painters, dolphins, birds, fishes, and snakes are woven together by means of the orthodox modern whirligig scrolls, form a whole which is as common and tawdry as it is meaningless and absurd. It would have been better if the committee (which includes the names of some well-known architects) before embarking on a scheme of such considerable magnitude and importance to the interior of such a fine club-house, had consulted someone who would have been content to have designed something more in harmony with a building which has so many good points, and not have spoilt the work of two architects, since deceased, with decoration which, although executed with a technique which is certainly not bad, has by the general vulgarity and coarseness of its effect taken away from the dignity of one of the grandest staircases in London. It reminds one of a Genoese palace.

THE experience of Messrs. Mather & Platt at the Salford Ironworks, as given in the *Times* of Thursday, in regard to their one year's experiment on the working of a "forty-eight hours' week," is of great interest, though we do not know that we should regard it as altogether conclusive. It was pointed out to the workmen, in a special circular, that it would be impossible to expect that the trade generally would carry out the movement unless they received some compensation from the men in the shape of "greater punctuality and increased energy and interest during the shorter hours." The time was taken off at the beginning of the day, the men breakfasting at home and having only one break in their day's work, for the dinner hour. We take the following particulars as to the financial result from the columns of the *Times*—

"The figures we have taken as the standard with which to compare results are the averages per year of the preceding six years, during the earlier portion of which the number of hours worked per week was fifty-four, and fifty-three hours per week during the later portion. The production during the two periods has been similar in character, and the turnover in the trial year has approximated to the average of the six years so closely as to be practically the same. As regards quantity of production, there was actually a larger output in the trial year; but, owing to the prices in that year being considerably lower than in the six preceding years, the turnover did not increase with the amount of production. This fact must be borne in mind in studying the following statement as to the cost of wages. On making up the books we found that, comparing the ratio of wages to turnover in the trial year with the ratio of wages to turnover in the six preceding years, there was an increase of 0.4 per cent. in the former. But as in the trial year selling prices were considerably lower, the actual quantity produced, as represented by the equal turnover of that year, was considerably larger than in the six preceding years, therefore the ratio of the cost of wages to the turnover in that year must have been proportionately less. Had prices ruled the same, the turnover in the trial year would have been greater, and the wages cost, instead of showing an increase of 0.4 per cent., would have shown a decided decrease. We have given no credit for this fact to the side of the trial year, but show the actual result as given on the comparison we have instituted—viz., an increase of 0.4 per cent. in the ratio of the wages cost to the turnover. This, however, does not exhaust the changes made by the reduction of the hours. We have had to discover what other advantages and disadvantages have arisen from it. The question of saving in consumables on the one hand, and the greater load of fixed charges on the other, have been the subject of close investigation. We have found a marked economy in gas and electric lighting, wear and tear of machinery, engines, gearing, &c., fuel and lubricants, and miscellaneous stores. On the other hand, we have examined the increased fixed charges due to interest of plant and machinery, rent and taxes, permanent staff on fixed salaries, being employed five hours less per week. The balance of debtor and creditor account on these expenses is unmistakably in favour of the trial year. The credit from these items to be carried to the trial year is an amount equal to 0.4 per cent. on the net amount of the year's turnover. Thus, by a remarkable coincidence, a saving of 0.4 per cent. is secured as a

direct consequence of the shorter hours, which counterbalances the debit of 0.4 per cent. in the increased wages cost."

As might naturally be expected, the improvement in regard to "lost time" was very decisive. Messrs. Mather & Platt think that there has been no undue pressure of working conditions, and observe that a year is rather a long period to carry on a "spurt." That is quite true, and there is something very attractive in the spectacle of combined energy of masters and men to show what can be done by making the most of shorter hours of time. We cannot help thinking, however, that this expenditure of increased energy in a shorter time must in the end mean a shorter average of life or of working capability among the workers. Work under pressure of time is the most wearing thing that there is, and it by no means follows that a pressure which can be kept up without sensible inconvenience for a year will not make its effects felt at the end of five or ten years. Of course it may be regarded as an open question whether it is best to work strenuously over a shorter life or to take work more easily over a longer one; but we imagine the sense of mankind even of those who do not shirk hard work, is on the side of the latter alternative. We frequently read lamentations over the comparatively early death of very hard-working men, who have overtaken their endurance before the average time; and that is what we think it must come to. It may be added that Messrs. Mather & Platt by no means desire the imposition of shorter hours by legislation; they speak decidedly on that point. They want to see it as an arrangement between employers and employed for the good of both. Whether it is so it will take more time to show.

A LONG report by Dr. R. Bruce Low to the Local Government Board deals with the circumstances of the river Trent in Lincolnshire and part of Nottinghamshire, with special reference to the water supplies of populations resident on or near the banks of the river, and to the occurrence amongst those populations of enteric fever. The Trent for a distance of about thirty miles from its mouth is a tidal river, swept at spring tides by a bore, locally known as "the Eygre;" the inflowing water rising to a considerable height and scouring up the mud in the channel and on the banks, increasing in this way the usual turbidity of the water. This, in itself, is not very promising for a river largely used for drinking-water supply, but we further learn that almost from its source the Trent becomes polluted with sewage. The river and several of its tributaries constitute the natural drainage of nearly the whole of Staffordshire. In its passage through the densely-populated Pottery district the Trent is admittedly polluted, and lower down the crude sewage of many places, as well as the effluents from sewage farms, mingle with the waters of the Trent and its tributaries. The sewage of Nottingham is disposed of upon land adjoining the Trent at Burton Joyce, about five miles from the town and about eighteen miles above Newark. The effluent, owing to the care which has been, and is being, taken with the preparation of the land used as a sewage farm, is, under ordinary circumstances, clear and free from objectionable smell. But in times of heavy rainfall it is found necessary to turn the contents of the flooded sewers of Nottingham direct into the Trent. In this and other ways much untreated sewage at times reaches the river. Still lower down the crude sewage of Newark passes directly into the Trent, and farther down still the town of Gainsborough discharges its sewage into the river. In addition to the towns last mentioned, the whole of the intervening places on the river drain into the Trent without any attempt at purification of their sewage. An instance is mentioned where an enthu-



enthusiastic admirer of Trent water, in a riverside village, was led to abate his enthusiasm after drawing a pailful of water from the river to fill his teakettle; on this occasion he found solid feces in the pail, and he has since discontinued the use of river water in his household. After this it is not surprising to read that "the River Trent cannot be regarded as a safe source of water-supply to any individual, or community, located on its banks. As showing how far this opinion has been locally recognised, it is only necessary to state that the towns of Newark and Gainsborough, which formerly drew their supply in the one case in part, and in the other wholly, from the Trent, have abandoned this source. Both towns have sunk new wells in the new red sandstone to provide supplies for their inhabitants. And it is evident that if the Trent is recognised to be unfit for supplying wholesome waters as high up as Newark and Gainsborough, it must be much less fit to supply the villages now using it below Gainsborough, after it has been further polluted by the sewage of these two towns and in other ways."

ON Wednesday evening, the 21st inst., Professor Silvanus Thompson delivered a lecture on "The Production of Electric Motive Power," at the Carpenters' Hall. He began by stating that it was important to notice that electricity was not a motive power; it was merely an agent by means of which we transmit power, just as a rope or belt going round two pulleys transmits power from the one to the other; but the rope or the belt is not a source of power. Coming to the relative cost of producing electric currents by batteries and dynamos, he stated that since zinc costs, roughly, twenty-five times as much as coal, and since we get from the combustion of 1 lb. of zinc only one-sixth of the energy we get from the combustion of 1 lb. of coal, the former method is the more costly. In electric light stations it was found that for every one Board of Trade unit we put into our mains, and for which we are not allowed to charge more than 8d., we have to burn 1 lb. of coal. A dynamo might be described as a kind of pump for keeping up a circulation of electricity with great pressure. The applications of electricity for transmitting motive power were practically endless. At Boston there were 400 miles of electric tram-rails, and there was more electricity being put out of the central station for these trams all day than out of the largest London station with its heaviest load on. He ventured to predict that in a few years we should use more electricity for motive power than for lighting power. One thing we had in this country which they have not in America, and that was electric railways for heavy rolling stock. Some interesting statistics were given of the transmission of a hundred horse power from London to Frankfurt, a distance of more than 100 hundred miles, by means of three copper wires each of only one-sixth of an inch in diameter. An illustration was shown of a motor of three-thousand horse power made by Siemens and Halske. Two motors of about half-a-horse power each were also shown running with the alternating current supplied by the City Company. In America we was much struck by the Co-operative Factory System. Large steam-engines and powerful electric machinery supplied currents to suites of rooms in a large building. Anyone could hire a room or set of rooms in the building and pay for the current he used by meter. He could also hire a motor, anything from a two-boy power upwards. There was no doubt that there was a demand for this kind of power in a place like Clerkenwell, for example, where there were plenty of workmen who could not afford a steam-engine or gas-engine, or perhaps lived in an attic where it would be impossible to have an engine, and who would willingly pay five shillings a week for the rent of a motor and 10pence per horse power per hour.

Electric power was especially the power for the poor man. The use of electricity for motive purposes would have considerable effect on certain industries, as for example, metal working and wood turning. We might hope that in the future, there would not be so much herding of men in large factories. Each man would be his own master, since motive power could be had economically without the necessity of a large capital outlay; so that we were justified in expecting that motive power being distributed so readily, so easily, and so cheaply would have no inconsiderable social influence on the future of certain industries. The lecture, which was illustrated by many striking experiments, was listened to intently by a large and enthusiastic audience.

IN the twelfth Annual Report of the Bradford Sanitary Association we have some interesting information given by Mr. Paterson, the engineer to the Association, as to some of the sanitary defects found by the officers of the association in the course of inspection in their district. One of the most curious of these consists in the frequent introduction, especially at Ilkley, of subsoil drains laid alongside and actually touching the walls of good houses at the footing level, and discharging directly into the foul drains: thus providing for the introduction of sewer air into the walls and cellars of houses all round. Another curious eccentricity of plumber's zeal in the cause of sanitation consisted in his having disconnected a sink waste from a soil-pipe and connected it with a rain-pipe which led into a storage tank of rain water. An instance of the revelations which may be afforded by the smoke test is mentioned in a case where smoke inserted in a lamp-hole in a shrubbery issued strongly in two closets, the scullery, coal-cellar, and the servants' attic. "The occupier was not aware of anything wrong with his drains." The report closes with a notice of the recent experiments of the Sanitary Institute on the flushing of water-closets, which the Bradford engineer rightly says "should be known and discussed as widely as possible;" and after treating with deserved ridicule Sir F. Bramwell's recent letter in the *Times* on the subject, and his "piston of water," Mr. Paterson puts the pointed question, "Are the drains to be stopped and the production of sewer-gas to be indefinitely increased within the breathing space of all large cities for the sake of economy of water?" Even the recommendation of the Sanitary Institute Committee Mr. Paterson considers to be short of the mark, and he observes that there is no reason to doubt the wisdom of the former policy of their own borough in permitting a maximum of at least five gallons.

IN the annual report by the Medical Officer of Health for the Whitechapel district on the sanitary condition of that district, we notice a very undesirable state of things alluded to in regard to water supply to some of the modern high buildings erected for what are called "model dwellings." It appears that during the prolonged drought of last year inconvenience was frequently caused through the absence or scarcity of water throughout that part of the district, which was supplied by one of the water companies, and that the difficulty was enhanced by the fact that whereas all other Metropolitan Water Companies are compelled to send water up to a height of 60 ft. above the pavement level, the Company referred to are only bound to afford a supply up to 40 ft. The effect of this arrangement has been to limit the water supply to many tenants residing in the upper flats of model dwellings. The medical officer was compelled, in one instance, to exert some pressure upon the owners of a block of buildings, where the tenants had suffered from the short supply of water; the owners issued a

summons against the company, and in the result, the summons was dismissed. Subsequently, a meeting was convened at which all the owners of model dwellings which were supplied by the company were represented. As the outcome of that meeting, memorials were forwarded to the London County Council by the owners of the model dwellings, as well as by some of the vestries and boards interested in the matter. The question, as the medical officer observes, is of vital importance to the health of the inhabitants, and the circumstance affords another example of the manner in which the health of London is at the mercy of the powers enjoyed by water companies to arrange matters for their own advantage rather than for the good of the public.

AN "Arts and Crafts Guild" has been formed at Sheffield with the object of improving the handicraft art of the city, the holding of exhibitions, and to bring the work of the members more prominently before the public. The scheme was formulated at a meeting held on the 22nd inst., at which various crafts were represented. No doubt this excellent movement will be followed in most of our large towns before long. Mr. Charles Green is the President of the Sheffield Society, and Mr. C. W. Crowder, the secretary.

ARRANGED round the walls of the great hall of the Town Hall at Fulham (Walham Green) are fifteen sets of drawings sent in in competition for the proposed decoration of the large hall, small hall, and staircase and vestibule. Owing somewhat no doubt to the awkward proportion of many of the panels in the great hall, many of the competitors have subdivided these features, and in some cases so altering them in form as to change the design completely. As schemes of colour the exhibition is not happy, the majority of the designs being altogether too strong in colour. Four sets, however, are of far greater excellence than the others. "Spes," in a treatment which he names "Raphaellesque," shows a very complete set of drawings, refined in detail and delicate in colour. In the great hall panels are arranged on either side of the large windows with figure subjects in red on an ochre ground. The ornament of the domes has been treated in blue on a delicate ground of flesh colour. The dado of the hall is shown in brown, but whether proposed to be carried out in wood is unexplained on the drawings. The vestibule has panelling introduced between the pilasters, with circular panels above containing figure subjects on a red ground. The small hall has likewise panels introduced with a row of small figures, in ochre, over it. The ceiling has fine Renaissance ornament in yellow and gold. "Seek and Deserve Success" shows the small hall in Pompeian red and white, with emblematic figures introduced in the panels. An interior perspective of the great hall shows "Muses presiding over Poetry, &c., in blue garments against gold backgrounds. The lower panels of the great hall are intended to have "medallion portraits of Historic Worthies of Fulham." Two other sets of designs which seem to us above the others in merit are by "Kudos" and "Delamere." We understand that the decision will be made in a few days.

WE notice that the senate of the Liverpool University are encouraging architectural design by the offer of prizes for the best designs made in competition by students of the Liverpool Architectural Society. The subject for the prize now to be given is "a Lake Boat House." The students' drawings are to be exhibited at an exhibition to be held by the Liverpool University in the course of next month. A committee of the Liverpool Architectural Society will adjudicate the prizes. The same committee



intends to promote during the summer a competition for the best set of measured drawings of some existing building.

WE hear that a subscription-list is opened for collecting 500*l.*, the estimated cost of restoring the Cufew Tower, Barking. It has been generally known as the Fire-bell Gate, and stands as an entrance into St. Margaret's church-yard (a similar tower was demolished thirteen years ago), and the room over its archway was known as the chapel of the Holy Rood, containing a relief of the Crucifixion. The two towers, perhaps, belong to the opulent Benedictine nunnery of St. Mary, of which part of the Abbey Church stood just within the north wall of the present grave-yard. The convent, reputedly the first established in England for nuns, was founded by Erkenwald, Bishop of London, a son of Anna, King of East Anglia (635-54), at the instance of Ethelburga, the bishop's sister, its first abbess. Her successors, with the superiors of Shaftesbury, Wilton, and St. Mary, Winchester, were baronesses *sui juris*, as owners of thirteen and a-half knight's fees, ladies of Becontree and Barnstaple hundreds, and patrons of fifteen livings, comprising those of All Hallows by the Tower, and St. Margaret, Lothbury, in London. Most of them were of noble or Royal birth, enjoying precedence over all of their station, and living in a great state, whereof records exist. King Edgar rebuilt and re-endowed St. Mary's, after its pillage by the Danes in 870, as atonement for violence he had offered to Wulfhilda, a nun of Wilton, whom he made abbess. The Abbey Church was again rebuilt *temp.* Mabelia de Boscum, abbess 1215-47, but after Dorothy Barley's surrender in 1539, when the revenue was assessed at 1,084*l.* per annum, the fabric fell into decay. In 1723-4 the ruins were explored. A plan in Daniel Lyson's "Environns," vol. iv., shows a regularly-built cruciform church with squared Lady Chapel, 170 ft. by 44 ft., having two transepts, 150 ft. by 28 ft., a nave of four bays, and choir of two bays; the nave and choir being 22 ft. wide, and the aisles 11 ft., and the arcade piers 8 ft. 6 in. in diameter at base. The precincts suffered considerably at the end of the fourteenth century by an inundation from the Thames, when the nuns expended 2,000*l.* in repairing the bank by Barking Level. A large amount of information about St. Mary's was collected by a Mr. Lethieullier, to whose family the property had passed by purchase in 1754. In 1876, says Mr. Walford in his "Greater London," were dug up in some ground belonging to the national schools, the foundations of the Lady Chapel, and the skeletons of two abbesses buried before the high altar. Lysons gives a drawing of the Fire-bell Gate, and a fac-simile of a charter (Cott. MSS.), granting lands to the convent, by Hodelred, father of Sebba, who, jointly with Sigeric, ruled over the East Saxon kingdom, 663-93. The original parish, since sub-divided, was thirty miles in circumference; it included 1,500 acres of Hainault Forest, one of its trees being the Fairlop Oak, blown down in 1820, and, by Uphall, an ancient entrenchment, oblong in shape, and enclosing forty-nine acres, supposed to be the site of a Roman town.

THE sale by auction of the second portion (800 acres) of the Littleton Estate is to take place in May. The property lies in Littleton, Laleham, and Shepperton parishes, between Ashford and Chertsey, and has been owned by the Wood family for many generations. The house is said to have been built by the same workmen who built William III.'s part of Hampton Court. All of it, except one wing, was burnt some years ago, and, we believe, the flames consumed Hogarth's painting of "Strolling Players in a Barn," of which J. Nichols says, in his "Biographical Anecdotes of William Hogarth," "Mr. Wood, of Littleton, has the original, for which he

paid only twenty-six guineas." Sir Guy de Bryen, King Edward III.'s standard-bearer, held the manor, with free-warren, in 1350. The Middlesex side of Chertsey Bridge across the Thames is in Littleton parish. The bridge, designed by James Payne, was built in 1783-5, of Purbeck stone; it has seven segmental arches, and replaces the wooden one mentioned by Leland. The present bridge is a very picturesque structure, but the arches are so inconveniently narrow for the river traffic that it is not unlikely that it will be removed and rebuilt before long on this account.

WE have received a circular in regard to the proposed formation of a "Watch Committee" to look after ancient buildings in London, with a view to preventing as far as possible their unnecessary destruction. The circular, which is signed by Mr. C. R. Ashbee, states the main objects of the committee as follows:—

"1. To undertake the work experimentally for one year; to systematically visit the old buildings of greater London; to catalogue them in the register and on the map; to find out, if possible, who are their ground landlords and their leaseholders, and ascertain the length of the leases; and to discover whether the local public bodies in whose province they lie, could be brought to preserve or utilise them for municipal purposes. 2. To confine the sphere of influence of the Watch to a radius of twelve miles, east and north of Aldgate, and bounded on the south by the Thames, this being the area into which greater London has been, and is rapidly extending, and comprising a great portion of Essex, one of the richest of English counties for old monuments. 3. To form, if possible, during the preliminary year, a watch committee, preferably of residents in the area suggested, who would undertake voluntary work in visiting and correspondence, and later, possibly, any financial liabilities in the continuing of the work. 4. To place the results of the year's work at the disposal of the S.P.A.B. The mystic initials are those of the "Society for the Protection of Ancient Buildings." The work proposed by Mr. Ashbee may be a very good and useful one, if only it is carried out with tact, with the recollection that the present has its rights as well as the past, and without that "priggish" assumption of superiority which has done so much to exasperate people against the S.P.A.B., and to impair the possible usefulness of its work.

#### FURTHER NOTES AT THE BUILDING EXHIBITION.

THE official catalogue, out a week after its time, is not very well arranged when it has come out. There has been a praiseworthy attempt at a system of arrangement in placing and in cataloguing the exhibits, by arranging the latter in rows, each marked with a letter of the alphabet, and placing the same letter at the head of the catalogue page; but the numbering is not consecutive, and except for the alphabetical list of exhibitors at the end, with a reference to the page in the catalogue on which their list is to be found, it would still have been difficult to discover the description of a good many of the exhibits. The blank column on each page for visitors' notes is a good feature. On the other hand sufficient care does not seem to have been taken that the description in the catalogue should represent in all cases the things actually exhibited. For instance, we find on page 10 a whole column taken up with a description of the advantages of a certain bath by Messrs. McDowall, Steven, & Co., but on inquiring for it the exhibitor's agent admitted that it was not there. This no doubt is a kind of thing which is the fault of exhibitors, who will seize such an opportunity to advertise wares which they are not at the trouble to send for exhibition. It only shows that exhibitors in these cases require a tight rein, and it should be made clear to them in any future case that they are forbidden to send in for the catalogue descriptions of anything which they do not intend to exhibit, as this is only bewildering and disappointing to the visitor.

The firm just referred to have a good exhibit of grates and kitcheners, among the special features of which are the lifting-fire arrangement, the cone ventilator for carrying off fumes into the chimney (which cannot be interfered with by the cook or attendants), and the hot plates made in a number of parts to allow for expansion and contraction without cracking, and also for enabling the back

boiler to be got at for cleaning without pulling the range to pieces. In the same class of work the Eagle Range and Foundry Company have a large exhibit, showing their range with adjustable fire-box; their excellent domestic grate, with regulating doors at top and bottom to increase and diminish the draft, and their chimney top for preventing down draught, which we described and gave a section of a short time since. The largest grate exhibit, however, is that of Messrs. Yates, Heywood, & Co., who exhibit a great variety of sitting-iron grates and chimney-pieces, the latter very well finished and in most cases of fairly good design as usual in such cases, the least costly and pretentious designs are the best. The "Pinkerton" grate, a circle on plan, with a semicircular back of glazed brick, has no special practical advantage, but has a very pleasing appearance. Among the more practical portion of their exhibits is the range with "quadrant" fire-lift, which is claimed as specially convenient in working, as there is no rack or catch, and the lifter remains automatically at whatever elevation it is placed. The "Guinness" draw-out oven is a useful one for small tenement houses, where the cleaning of the flues (often neglected) is rendered easy and inexpensive by the lifting out of the oven bodily. The same firm also exhibit specimens of their stable fittings.

Among window exhibits which we did not notice before is Mr. Robert Adams's Climax reversible sash window, the special feature of which is that the cords are attached to sliding pieces to which the actual sash is screwed by removable screws with large milled heads; this gets over a frequent difficulty in regard to reversible windows in which ordinary cords and weights are used, what to do with the cords when the sash is taken out. It has the objection that the screws are liable to get lost or forgotten when the sash is taken out, but has merits nevertheless. His "impervious" metal casement has four conical surfaces, and seems impervious; the bolt is not a very firm one, at least in the example shown. Messrs. Manzner & Farrar's steel casements, if they do not seem quite so satisfactory in regard to probable weather-tight quality, show admirable solid work in the fittings, which entirely get rid of the rather shaky and rattling character too often associated with metal frames and their fastenings.

The Incandescent Gas Light Co. exhibit their lights in action. The light is an excellent one in relation to the amount of gas consumed, and the readiness with which it can be attached to existing burners; the only objection which may be made to it is that the burner has rather heavy and clumsy appearance; but in situations where this is not of consequence the gain to the consumer in light is no doubt very great.

Those who visit the exhibition with the idea of seeing how the electric light should be installed in a building already constructed, or how provisions may be made in a building about to be erected, for its subsequent installation, will be disappointed. Not only are there no illustrations of the various methods of running the wires, but there are not even examples of such all-important appliances as distributing-boards, switches, and fuses. There is, indeed, but little to notice beyond the ordinary lamp-brackets and fittings. The extensive exhibit of the Coalbrookdale Company, already mentioned, gives Mr. Harrison South an opportunity of showing examples of his artistic metal work as applied to electric light fittings. Some of these fittings are of very elegant design, especially adapted for drawing room lighting, a soft and pleasing effect being produced by the introduction of silk shades enclosing the lamps. He also exhibits other more massive fittings suitable for theatre lighting, which he makes a speciality. Current is supplied by a Crompton Dynamo driven by a Tangey Gas Engine.

Messrs. Roger Dawson exhibit some electric light fittings of black iron work at the stand of Messrs. H. & A. Hooydonk, and at the stand of Messrs. Potter & Sons are a few highly finished pendants and brackets of black iron. Messrs. Edmundsons, of Great George-street, Westminster, exhibit electric light fittings, also a motor driving a fan at the stand of Messrs. Ashwell & Nesbit; and Messrs. Pickup & Co., of Bury, Lancashire, show an electrically driven fan in which the frame is wound with four coils to form the field magnets, and a ring attached to the outer ends of the blades is wound to form the armature, a commutator of usual construction being fitted to the fan spindle. The object of this arrangement is to induce immediate starting of the fan at whatever point it may have been stopped, an object which is certainly attained, and



the start on turning on the current is instantaneous. It is, however, difficult to discover any novelties of an electrical nature throughout the exhibition.

Mr. John Sutton exhibits a patent chimney cowl (metal) for preventing down-draught, which seems as if it really must be thoroughly efficient, in contradistinction to some much-advertised remedies. The chimney is fitted internally with a system of oblique baffle plates, so placed that any down-draught striking on them is diverted to a slit in the side which carries it away, while any wind coming in through the slit creates an induced current. We will give next week a section of the cowl, which differs in construction from any other that we have seen, and is not easily understood by description. The baffle plates, which may be from one to four in number, are connected by wires when there is more than one, and hung with a certain amount of play so that they can be shaken from below with a cleaning rod in order to shake deposit off them. Whether this would prove a really effectual method of cleaning may perhaps be doubted. The cowls are made in galvanised iron or zinc.

Messrs. Humpherson & Co., sanitary engineers, have a good exhibition of appliances, including what they call the "Perfect" valve closet with an improved overflow arrangement, which has the merit of appearing to work efficiently with a small supply of water. Their "Triune" closet is so-called from being made in three parts, the earthenware basin in a metal stand, and the lead trap-bend below, which can be attached to the basin at any angle according to its situation. The idea that lead bends are superior to the earthenware bend, on account of making a better junction with the soil pipe, has something to recommend it, but we doubt if they can ever be as clean as a glazed earthenware bend. Among other closets exhibited (they are not very numerous) is Kingston's "Silent" Flush Tank, in which the water is introduced at the bottom instead of at the top of the tank through a metal valve which closes automatically when the tank is full. The valve is fitted with a screw propeller, which the rush of water causes to rotate, so as to keep the metal seating contacts closely fitting (on the same principle as Lord Kelvin's tap). The tank is air-tight, and the flushing power is gained by the compression of the air when the tank is filled. One advantage claimed for this is that it requires no fall and can be placed out of sight under the closet-seat when there is a cased seat; but as we disapprove of cased seats altogether, there is no real advantage in having the tank on the floor, where it is more in the way than on peers on the wall. Still it is a clever and workmanlike piece of mechanism. We may also mention the exhibition by Messrs. Shanks & Co. of their baths and lavatories, which are of excellent quality, but present nothing for special comment.

Among fireproof floors a good one is exhibited by Messrs. Ferguson & Sons, of Carlisle, composed of steel or iron joists and a continuation of fireclay tubes and concrete. The tubes are 12, 13, 14, 15, and 18 in. wide, two being put together to bridge over the space between the joists. Concrete is filled over these pairs of tubes and between them. The concrete between the tubes forms a key to bind the tubes together, that over the tubes forms the level floor. The peculiarity of this floor, as will be seen, lies in the fact that the terra-cotta tubes are placed parallel with the iron joists instead of at right angles to them. It makes a solid but rather heavy floor, most suited for situations where weight-bearing capacity is of importance. Messrs. Willis & Astley's "Fireproof and Ventilating Floor" forms what is called (not quite accurately) a "concrete arch" on corrugated iron centering between the iron joists; terra-cotta "lintels" are placed across, partially imbedded in and partially below the concrete, with wide soffit flanges to form a ceiling; these flanges pass below the iron joists so as to encase them. The webs of the terra-cotta lintels are pierced to allow an uninterrupted circulation of air between the terra-cotta ceiling and the concrete arch, and the patentees state that it is specially on account of this large air-space that they claim fireproof quality for the floor, as the joists and concrete of a floor above the fire are insulated from the heated ceiling below, which is no part of the bearing construction. This would perhaps, delay the break up of the concrete and iron for an appreciable time.

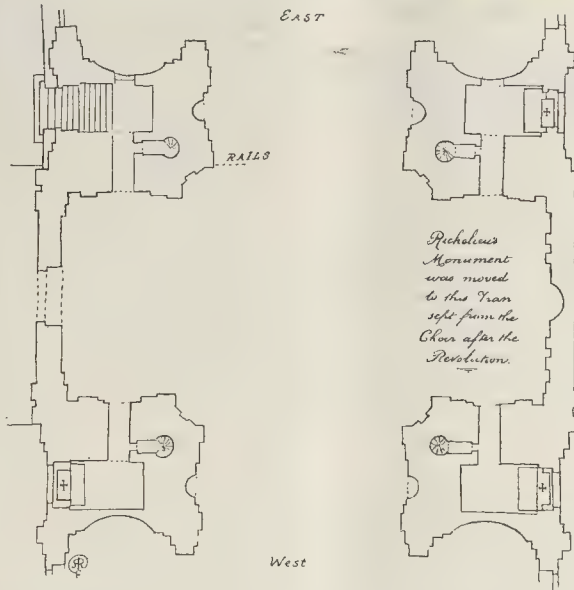
Among objects of which we made a note we may mention Sinclair's comet lamp for contractors, which burns petroleum oil, and by the operation of an air-pump is self-cleaning after

use; Mr. C. Rees's metalised wood for decorative purposes, which is a perhaps almost too good imitation of metallic surface; Messrs. Hartley & Suggden's "Chatsworth" boiler, with the flue returned along the top of the boiler; Messrs. Hepton & Sons' corrugated copper cylinder, for securing resistance to pressure at a low cost; Messrs. King & Sons' honeycomb terra-cotta wine-bins, which are more lasting and perhaps in other ways better than metal bins, but take up rather more space for the same number of bottles; Mr. A. G. Bell's fire-resisting doors made of wood, with an interior lining of asbestos, which have stood some severe tests and combine lightness and economy with efficiency; Mr. Swift's dovetailed back for securing tiles on walls, before noticed in our columns; Messrs. Messer and Trollope's bucket fire extinguisher, in which buckets are placed in a water tank telescoped together, each coming out full in its turn, an exceedingly compact way of arranging buckets for this purpose; there is the disadvantage that one can only get hold of one bucket at a time, but two or three of these tanks would include a good deal of bucket-power in a very small space; Messrs. Manning & Andrews' syphonless flushing cistern, which is simply a tumbler bucket arranged to fill itself automatically when empty, and certainly has the advantage of simplicity and nothing to get out of order; and Messrs. Grundys' house-warming apparatus for warming fresh air and furnishing a continual stream of it into a house.

We may have more to say. Machinery exhibits we have purposely omitted for separate treatment.

#### "SECRET CHAPELS" AT THE SORBONNE.

THE Sorbonne Church, designed by Le Mercier in 1635, has the first dome ever constructed in Paris, and it is reported that when, one misty morning, the Archbishop of Paris went to Montmartre previous to giving orders to the architect of the Native Church there as to whether the great church should be capped with a dome or have a tower and spire, he decided on a dome, as it would "stand out" whenever there was a hazy atmosphere, while other forms of steeples, even loftier, would be invisible, and that the first dome he saw that day most clearly from Montmartre was that of the Sorbonne, a fact which caused him to decide in favour of a dome for Montmartre. All descriptions of the Sorbonne Church, from the latter half of the seventeenth century onward, give glowing accounts of this handsome and beautifully-proportioned dome, which rises to the height of 139 ft. from the floor



Plan of Dome-Piers of the Sorbonne Church, showing the Secret Chapels.

of the church, and is 40 ft. wide at its base. It looks its best from the Boulevard St. Michel, and is far more graceful than that of the Pantheon hard by.

In the seventeenth century the Church of the Sorbonne had no less than nine altars, three of which were strangely hidden away in as many little chapels in the base of the walls supporting the dome, as will be seen by the sketch plan. These unique little sanctuaries were "proprement boisées," says Thierry, writing in 1787; and each contained a picture by a celebrated master. The inner arch on the dotted line in the plan of the North-west Chapel is bricked up now, but the trace of it is there in the shape of a crack in the plaster following the outline of the arch. The rest of the North-west Chapel is now used as a lumber-room. The South-east and South-west Chapels have been blocked up since 1866, when marble slabs, with inscriptions in memory of Richelieu, were put up over the old entrances when the Cardinal's skull was returned to his tomb after having been lost sight of for seventy-three years.

If further corroboration of the existence of the "Secret Chapels" were required, it would be found in Harry Peckham's "A Tour through Holland . . . and to Paris," published in 1788, where he writes as follows:—"In the chapel dedicated to the Virgin" (now the south transept, occupied by Richelieu's monument), "is her statue, in stone, mostly done by Desjardins or Maître de Jardin, who executed the statue of Louis XIV. in the Place des Victoires. You will find in a little adjoining chapel a picture of St. Anthony preaching in the Desert. He is seated in an armed chair; not a very common convenience in a desert, nor a very proper attitude for a preacher, but his hair is grey, which is, I suppose, to be an apology for his sitting. Coppel is the master, and the piece does him credit."

Which of the two secret chapels on the south side is referred to, it is impossible to say; but it is to be hoped that, in the approaching restoration of the Sorbonne Church, at least the most accessible of the three little chapels will be opened out—*i.e.*, that on the north side, when possibly a discovery of the pictures may be made, if not of the altar.

JOHN A. RANDOLPH.

CLOCK, HIGH HAM, SOMERSETSHIRE. — The parish church of the village of High Ham has just had a new clock fitted in the tower. The hours are struck upon a large bell. The clock has been made generally to the designs of Lord Grimthorpe by the makers of St. Paul's Cathedral clock, Messrs. John Smith & Sons, Derby.



## Illustrations.

### CHIMNEY-PIECE, KNOLE HOUSE.

**THIS** illustration is reproduced from a plate in Mr. Gotch's "Architecture of the Renaissance in England," a review of the latter portions of which will be found in this number. It probably formed part of the decoration of Knole House by the Earl of Dorset, early in the seventeenth century.

### ILLUSTRATIONS OF AUDLEY END.

THESE illustrations, from photographs by Mr. Bedford Lemere, are published in this number in connexion with the subject of English Renaissance architecture, treated of on another page.

Audley End was built in the early years of the seventeenth century, by the first Earl of Suffolk, and was called Audley after the owner's grandfather, Lord Audley, the first owner of the estate. According to Mr. Gotch's notice in "English Renaissance Architecture," the building cost the great sum, for those days, of 190,000*l.*; but less than half of the original building is now standing. For further remarks on it see the first article in the present issue.

### METAL WORK, TULLIE HOUSE, CARLISLE.

THESE illustrations of iron and lead work at Tullie House, Carlisle, are reproduced from Mr. C. J. Ferguson's detail drawings. The conduit at the foot of the water-spout is of lead (not so marked on the drawing), and rests on the first stone cornice, so as to convey the water into the inside of the open archway and prevent the public from having the opportunity of damaging the lower part of the pipe.

The gateway, of wrought iron, closes the archway referred to; the detail in the head is also given on a larger scale.

### MODERN INSTITUTIONS, ASYLUMS, AND HOSPITALS.

UNDER the auspices of the Worshipful Company of Carpenters, a lecture entitled "Modern Institutions, Asylums, and Hospitals," was delivered on Wednesday evening at the Carpenters' Hall, London Wall, by Prof. Roger Smith, F.R.I.B.A. Mr. Warden E. Smith presided.

The lecturer said his subject was furnished by public institutions, of which it might be said that they were modern and of high civilisation. The great institutions which abounded in Great Britain—and, indeed, in Europe—had no counterpart in the history of the remote past, nor even in the customs of the remote present. These institutions included, in one direction, hospitals, asylums, orphanages, schools, sanatoriums, workhouses, infirmaries, and even prisons; in another direction there were board schools, technical institutions, polytechnics, laboratories, and colleges. This was a large subject, so that it would not be possible to say anything about Continental or American methods of dealing with such buildings. There were more ways than one of arranging these of these structures, and, notwithstanding the general diffusion of information and the ease with which it was possible to visit other countries, the Channel and the Atlantic still separated English methods of arranging such buildings from those of France, Germany, and the United States. Some of the earliest traces of big institutions were to be found in India, where Buddhist monasteries were established long before the Christian era, and hospitals were said to have been established to some extent in connexion with them. In Europe the monasteries of the Middle Ages bore a very considerable resemblance to those of the Buddhists, and they were the first public institutions. But the resemblance of all such buildings to modern institutions was very limited. Referring to the first establishment of hospitals for the sick, the lecturer said that St. Bartholomew's dated as far back as the twelfth century, St. Thomas's not being much later, while Guy's was established in 1724. It was stated by Mr. Burdett that there were 8,094 beds in the London hospitals, which accommodated 78,000 sick persons in a year, and that in the asylums for the sick poor of London there was accommodation for 14,000 more. The number of idiots, insane and imbecile, provided for in institutions was equally startling, and the children lodged and fed in orphanages, schools, &c., supported by City companies and public subscriptions, made a further very large army. All these people had to be provided for in suitable ways, and the many differences which existed

between the several kinds of inmates caused much variation in the buildings themselves, and a great deal had to do with the measure in which the inmates were able to manage for themselves. In many respects the principles upon which hospitals were designed had very much influenced the planning of other institutions. Taking the subject of hospitals first, and devoting considerable attention thereto, the lecturer pointed to several illustrations which were exhibited on the walls. He then dwelt upon the chief objects to be borne in mind in the planning of the wards of a hospital, these including the provision of fresh air, sunlight, scrupulous cleanliness, warmth and cheerfulness, to secure which was the aim of the hospital architect. Under these several headings the Professor gave some sound advice, and he referred also to the many distinct branches in hospitals, for which separate provision had to be made. As to the cost of these institutions, a general hospital was now being erected at Birmingham, having accommodation for 340 beds, and as this might be taken as a good example of what such a building should be in these days, the cost of it would be a fair guide. The figure in this instance was 206,000*l.*, including the land, or 158,000*l.* without the land. After dwelling upon the various considerations which had to be taken into account in the erection of public asylums, institutions for the boarding and education of children, &c., the lecturer, coming to the question of technical schools and polytechnics, said that in Germany and Switzerland large and elaborate buildings had been erected in almost every important city where technical instruction might be given. In Great Britain they had now become convinced that it was their duty to furnish such institutions, the popular form of which had derived its name, and to some extent its nature, from the Polytechnic in Regent-street. The Carpenters' Company had established one at Stratford, and this was highly spoken of by authorities well competent to judge, including some who had come from India to see it. The People's Palace was the first example of a structure erected for the express purpose of one of these institutions. Alluding to the many requirements of establishments of this nature, the lecturer pointed out distinctive features in such buildings as the Carpenters' Company's new technical schools, King's College, University College, Cowper-street School, the Science Schools at South Kensington, &c. Towards the close of the lecture the lecturer spoke of the debt of gratitude which was due to those who, for the most part voluntarily, gave up their time to the management of these institutions. His lecture, he said, was nothing more than a glimpse at a very wide subject, but perhaps enough had been said to convince those present that the buildings erected for English institutions formed a group of public works very well worthy of study. Their contrivance and design required much patience, care, and forethought, and above all, special and exact knowledge of the requirements; their erection called for the best workmanship and the use of the soundest materials; and their maintenance in a state of perfect efficiency demanded constant vigilance.

### ARCHITECTURAL SOCIETIES.

**ARCHITECTURAL ASSOCIATION.—DISCUSSION SECTION.**—A meeting of the Discussion Section of the Architectural Association was held at 56, Great Marlborough-street, on the 21st inst., when Mr. Charles H. Strange, A.R.I.B.A., read a paper entitled "Hints on the Formation of an Architect's Library." The discussion was opened by Mr. Seaman, and was continued by Messrs. W. H. White, S. B. Beale, H. A. Satchell, E. Greenop, and C. H. Brodie (the Chairman), and was summed up by Mr. Alex. Graham, F.S.A., who attended as Special Visitor.

**SHEFFIELD SOCIETY OF ARCHITECTS AND SURVEYORS.**—A special general meeting of this Society was held at the School of Art on the 20th inst. Mr. E. M. Gibbs presided. A paper was read by Mr. J. Smith on a recently-published book by W. J. Loftie on the works of Inigo Jones and Sir Christopher Wren, or the rise and fall of modern architecture in England. The paper was a review of Mr. Loftie's opinions and statements as to modern English architecture and architects. Mr. Loftie asserted that the shortcomings of modern architects were largely the fault of the public who employed architects rather than of the architects themselves. There was no doubt of the fact that the history of a community was registered in its architectural work. A discussion ensued, and on the motion of Mr. C. Hadfield, supported by Mr. W. C. Fenton,

Mr. J. E. Benton, and the President, a vote of thanks was awarded to Mr. Smith for his paper.

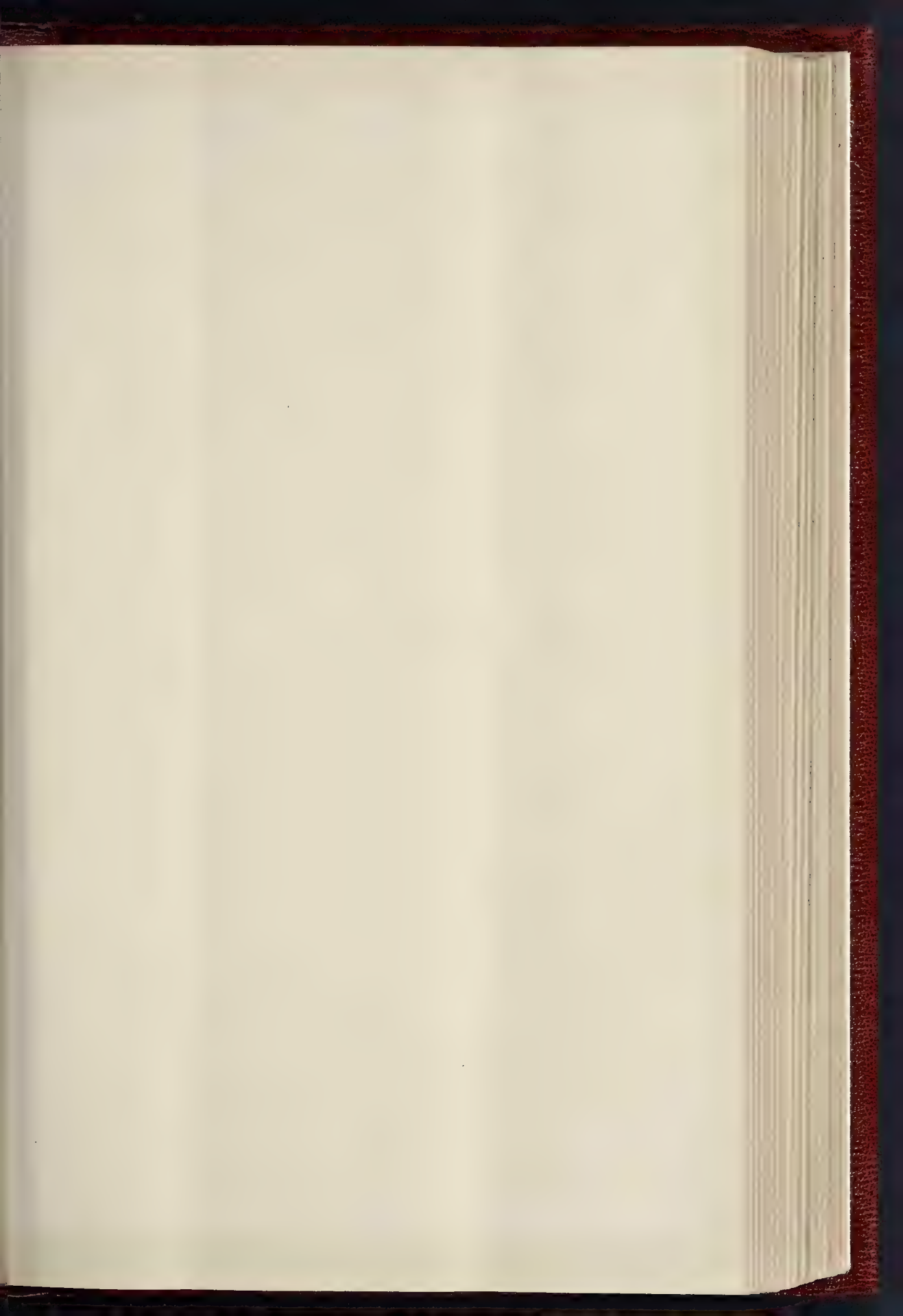
**EDINBURGH ARCHITECTURAL ASSOCIATION.**—The members of this Association visited Science School on the 24th inst. Mr. Wilson, the architect of the school, stated that the class-rooms and lecture-rooms were designed to accommodate 1,686 children, allowing 10 square feet for juveniles, and 8 square feet for infants. If the area of the gymnasium and swimming-bath were added the accommodation would be 1,990. The site extended to 1½ acre, and had been acquired for 5,676*l.* 18s. 6d., which sum included the expenses of purchase. The total cost of the school, including fittings, offices, playshed, janitor's house, &c., was 21,874*l.*, or barely 11*l.* per child, basing calculations on the full accommodation of 1,990. After Mr. Wilson had explained from a diagram the arrangements of the school, and had described the system of mechanical ventilation, a tour of inspection was made, and the uses of the various class-rooms pointed out, and the peculiarity of their furniture to suit requirements was noted.

**CARLISLE ARCHITECTURAL ENGINEERING AND SURVEYING ASSOCIATION.**—At the usual fortnightly meeting of this Association, held on the 21st inst. in the Town Hall, a lecture was given by Mr. J. Hepworth, M.Inst.C.E., on "Our Streets and Roads." He commenced by enlarging upon the excellent Whinstone and granite pavements laid in Carlisle, and pointed out the favourable situation of Carlisle for procuring paving material. After referring to the various classes of paving in general use, the lecturer mentioned the following requirements of a good carriageway pavement. It must be a sanitary pavement, and as noiseless as possible. It must be safe for horses, and afford a sufficient foothold with a minimum of traction. It must be as free from mud and dust as possible. It must be economical, not only as regards first cost, but also with respect to its maintenance and cleansing. It must be durable. It must be easily cleansed and non-absorbent of moisture. It must admit of being readily taken up and quickly relaid for repair at all seasons. He then proceeded to consider the advantages of tar-paving as a class of pavement for which it is claimed that most of the above requirements are met, and at a proportionately small cost, and said, although there was much difference of opinion amongst surveyors about its adoption, the towns of Cheltenham, Shrewsbury, Harrogate, Scarborough, and Nottingham almost exclusively use tar-paving in the principal and residential streets with great success, and at a cost of from a third to a fourth that of granite or Whinstone paving, and stated that on hygienic grounds tar-macadam was undoubtedly to be preferred. The lecturer read several specifications for the mixing and laying of tar-paving, and quoted the opinions of several authorities who, after a proper trial, have reported favourably on its adoption in residential streets and back lanes. The objectionable features of the smooth surface and the black look of the roadway are easily overcome by proper mixing and laying, and the finished coating being made with a light coloured and gritty material. A discussion followed, and a vote of thanks was accorded to Mr. Hepworth for his lecture.

### COMPETITIONS.

**SCHOOLS, CLENCHWARTON, NORFOLK.**—The School Board for the Clenchwarton Parish, having advertised for plans to be sent in for new schools and master's house, have received sixty-four sets of designs. The Board have accepted those of Mr. H. Green, of Norwich, while those of Mr. J. H. Gibbons, of Birmingham, were placed second.

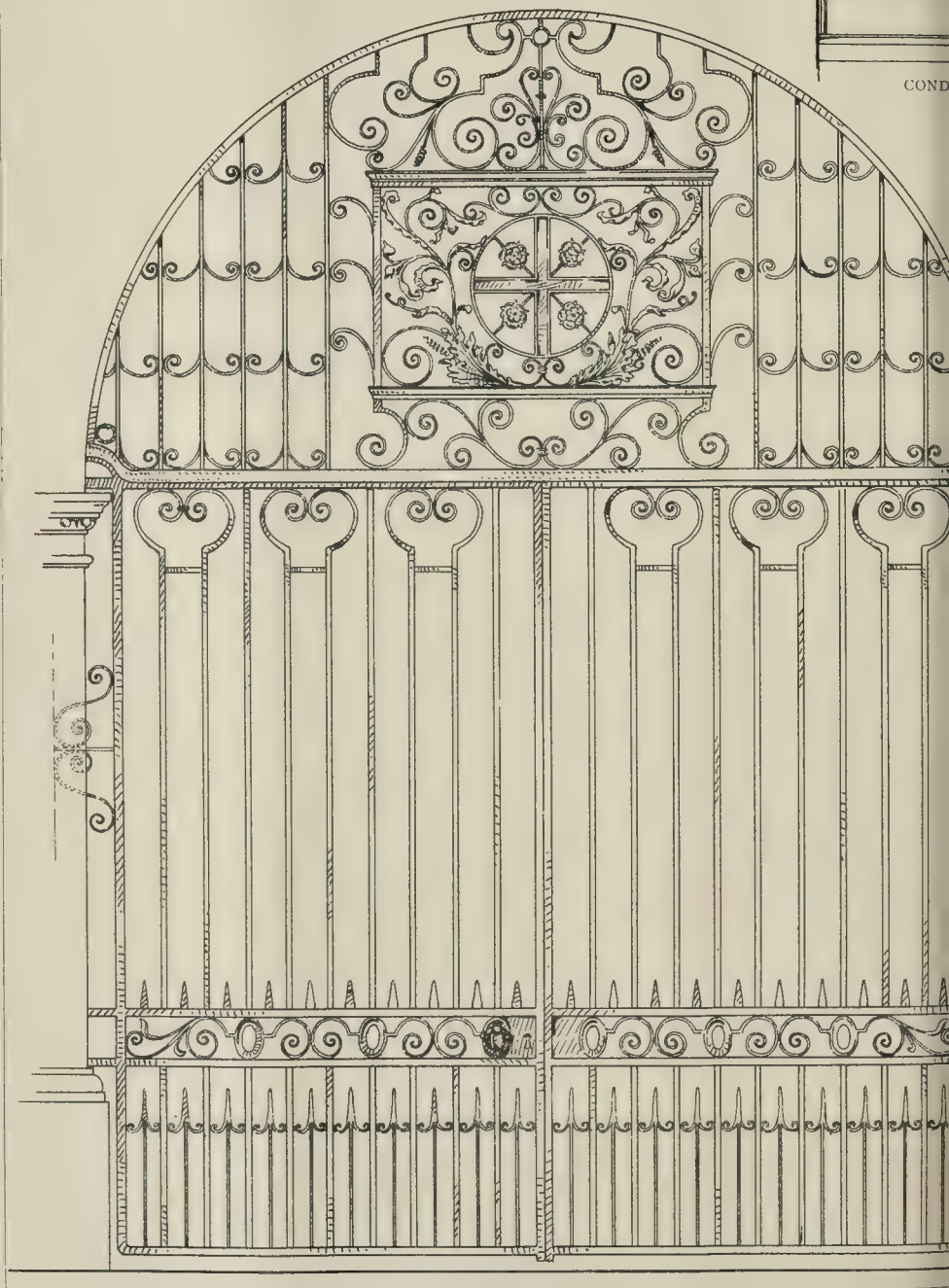
**HIGHGATE ARCHWAY.**—The much-needed improvement in widening Highgate Archway seems to be as far as over being carried out. The London and Middlesex County Councils, the Islington Vestry, and the Hornsey Local Board agreed to give 5,500*l.* each to enable the former to rebuild the archway, the London County Council to take all risk, and to promote the Bill in Parliament necessary to carry out the work. The Bill has now been presented, and the expenditure is not limited, but makes each of the bodies named liable for one-fourth of the cost, after giving credit for 1,000*l.* which the Ecclesiastical Commissioners will give towards the work. Under the Bill the London Council would become freeholders in Hornsey, thus getting a footing in the county of Middlesex, which is thought, in view of the "longing eye" London has upon Hornsey, to be very undesirable. Upon these grounds three of the four authorities will oppose the Bill in Parliament.—*Daily Chronicle*.

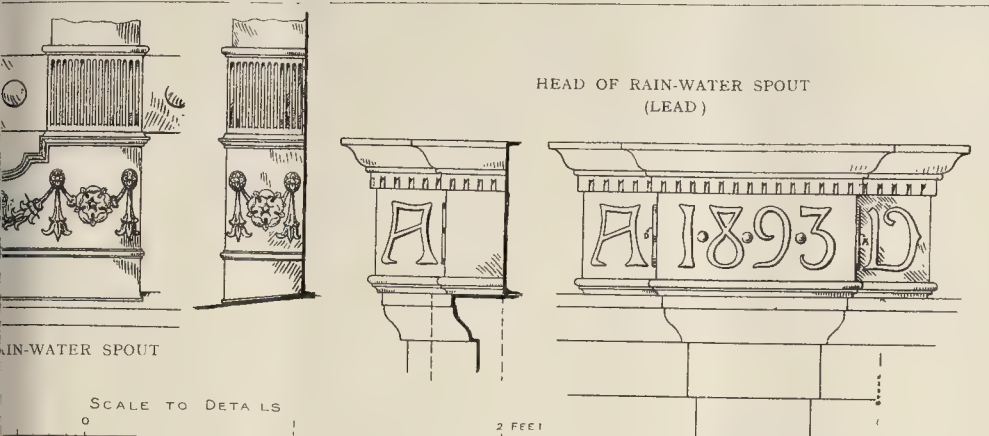




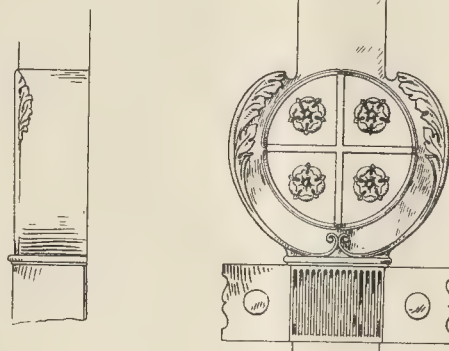
GATES TO MAIN ENTRANCE

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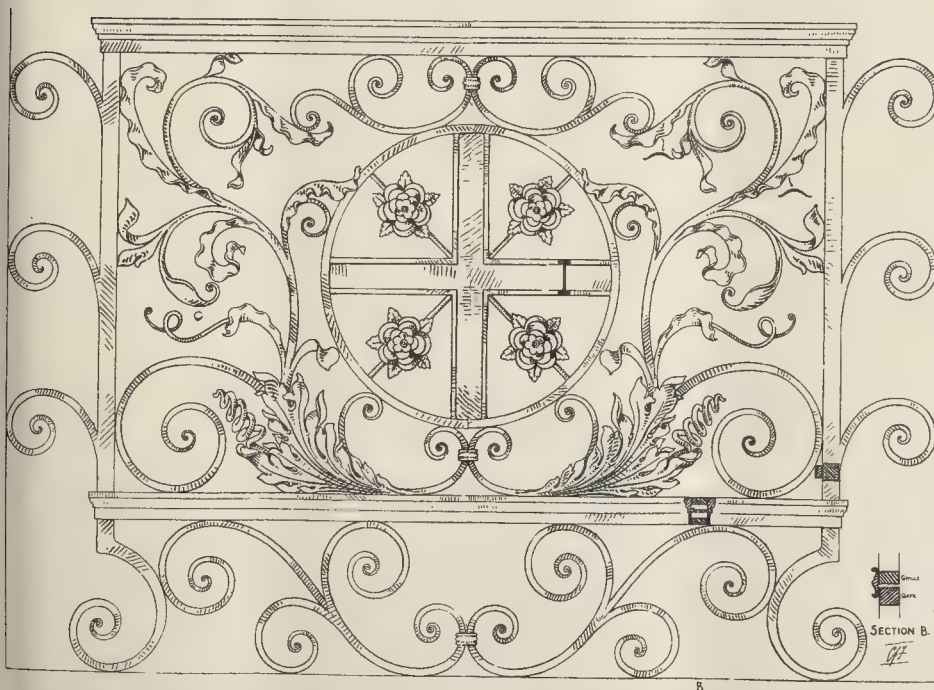




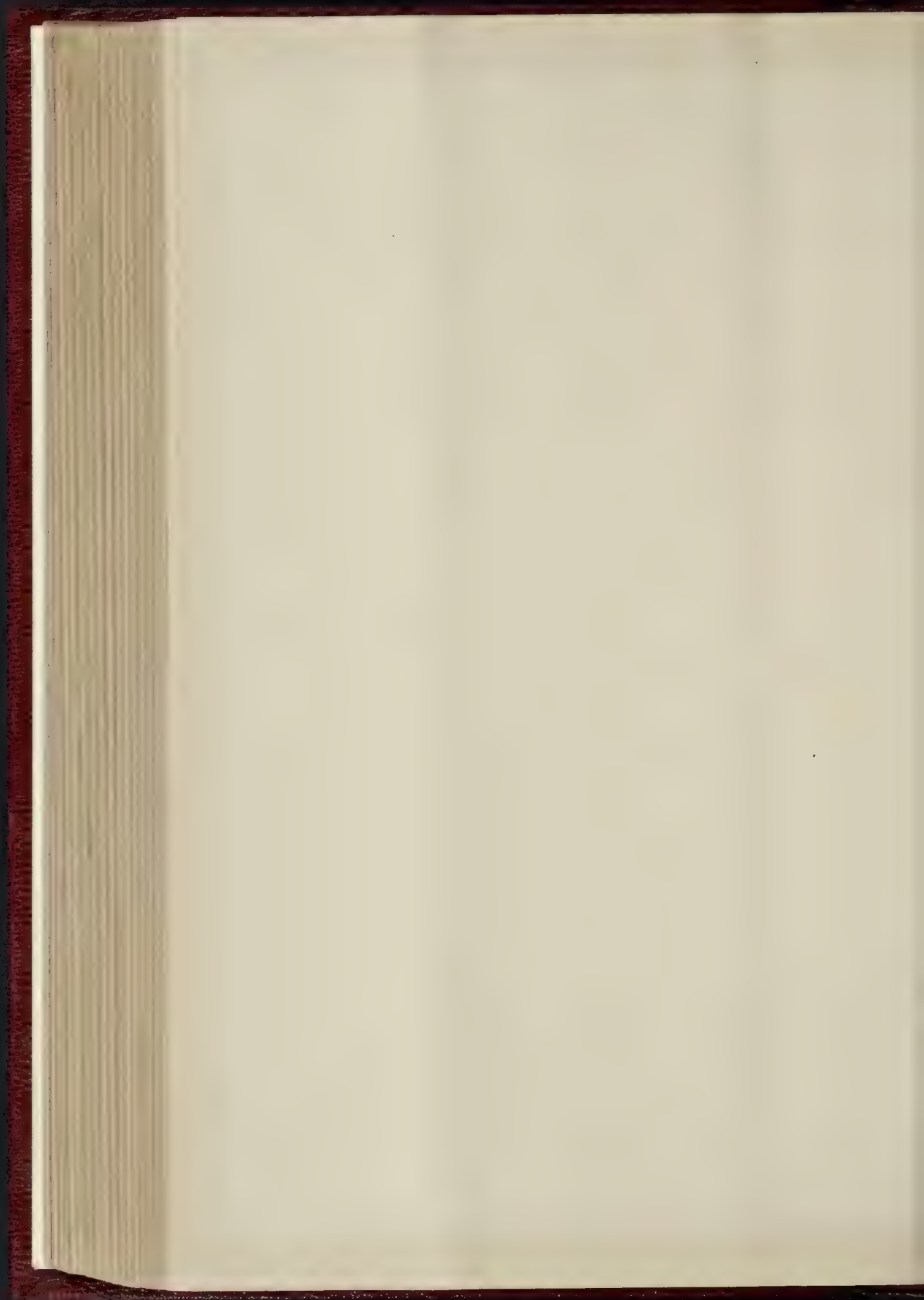
DETAILS OF METAL WORK,  
TULLIE HOUSE, CARLISLE.  
FERGUSON, ARCHITECT.



DETAIL OF ORNAMENT IN HEAD OF GATE











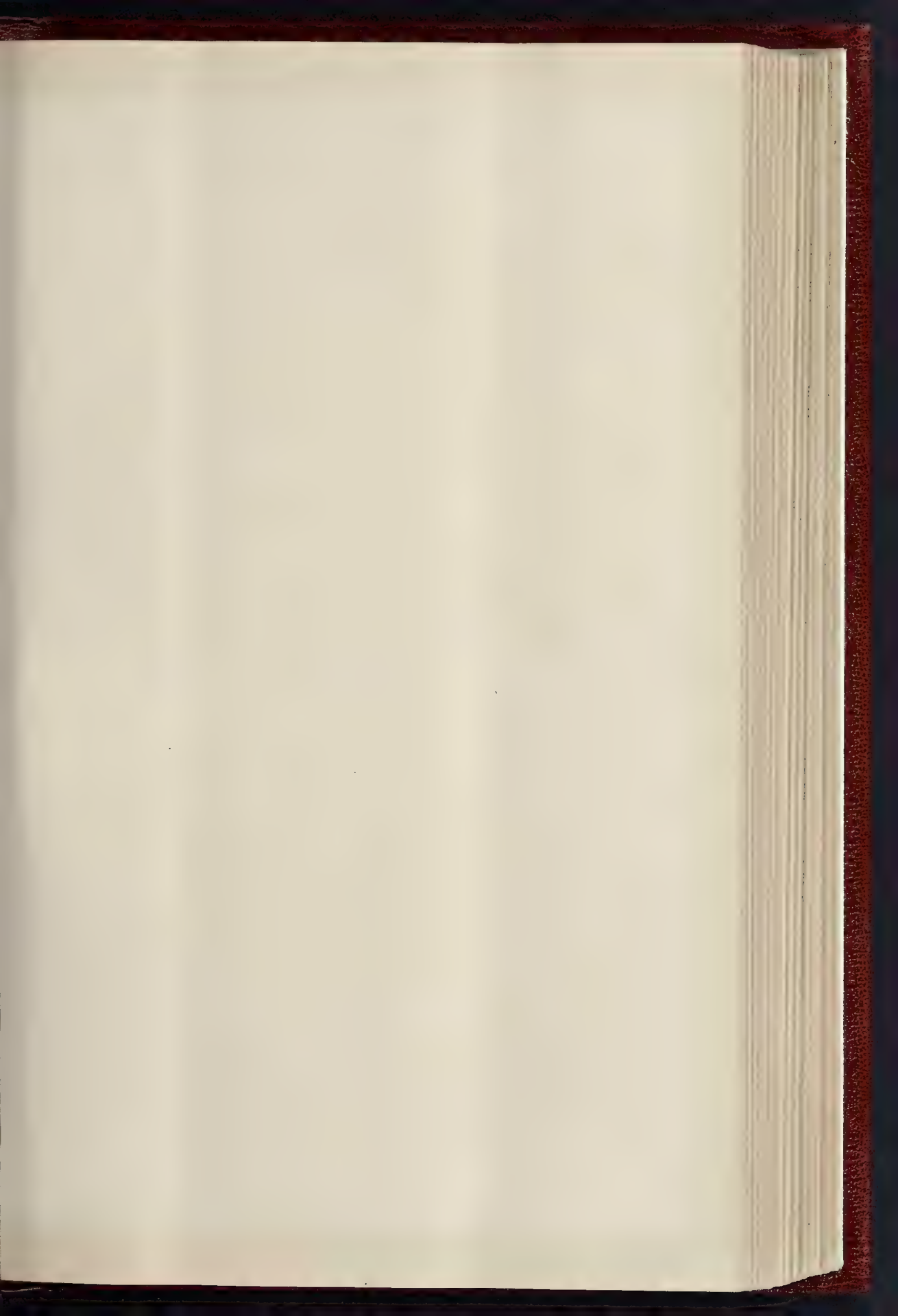


PRINCIPAL FRONT.



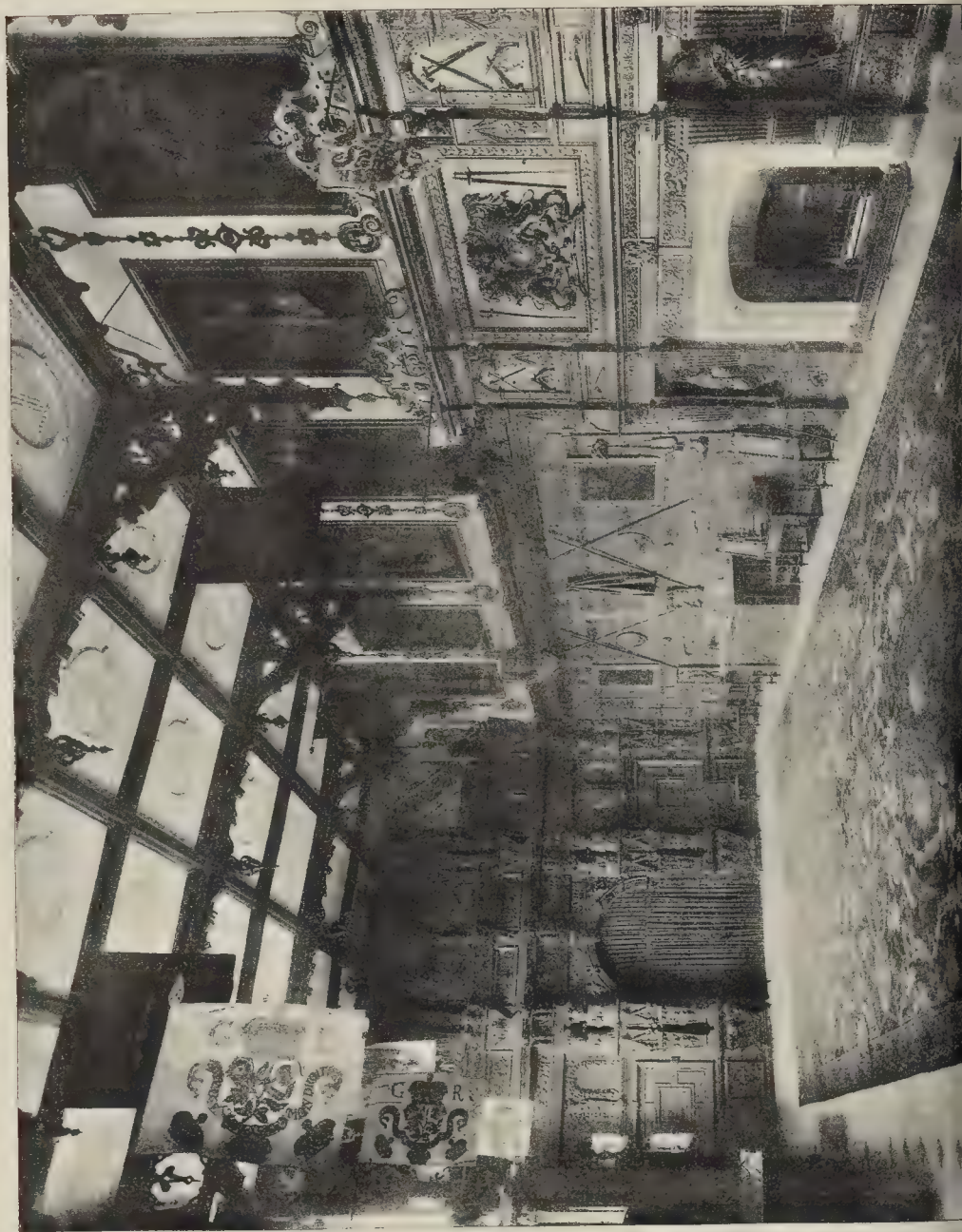
WEST FRONT.

AUDLEY END





THE BUILDER, MARCH 31, 1894.







FIREPLACE, AUDLEY END







NORTH PORCH, AUDLEY END



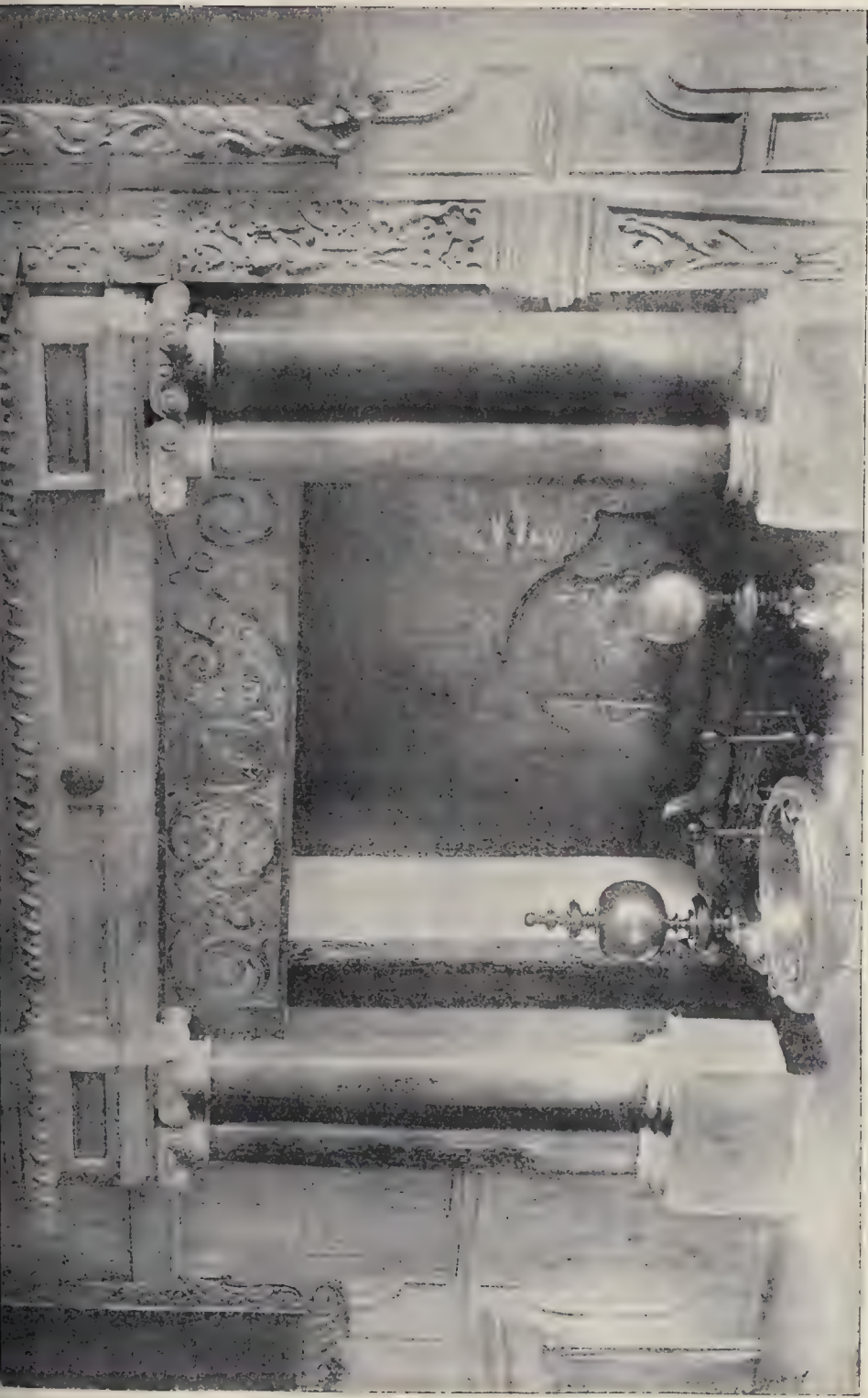






THE BUILDER MARCH 31, 1894





CHINESE STUDY IN KALI LOOM KNOT HOUSE





## ARCHÆOLOGICAL SOCIETIES.

BRITISH ARÆOLOGICAL ASSOCIATION.—On 21st inst. a meeting of this Association was held at the residence of Mr. Allan Wynd, F.S.A., in the chair. The Secretary, Mr. J. H. St. John, read a paper on "The discovery of late date, in Carnarvon Church. Mr. J. H. St. John exhibited various coins, mostly of the reign of Edward the Great, recently found in Southwark. Among these was a seventeenth-century token for 2d., issued by a tradesman at Dowgate. Mrs. Collier exhibited an Elizabethan love-token ring formed of twisted hands. An exhaustive paper on "The story of English Parishes" was read by Mr. J. H. St. John. After referring to the growth of Christianity throughout the Roman Empire, he traced its increase under Severus, when Christians were allowed to buy land and to build, and the effect of the Edict of 303 for the demolition of churches would have affected Britain and Western Europe. He then referred to the few records of Christianity in Roman Britain, and the existence of the faith after the arrival of the Saxons by the antagonism of Augustine and his followers, and by that of the See of York to Canterbury. The work of Archbishop Theodore, who dwelt upon at length, and it is to him that the division of England into parishes is assigned. A discussion followed. A paper on the discovery of various structural features of Saxon and later times, at Repton Church, by Mr. J. T. St. John. It was illustrated by plans and drawings.

## Books.

*y's Directory of the Building Trades.* London: Kelly & Co., 182, 183, and 184, High Colborn, W.C.

*Directory of the Engineers and Iron and Metal Trades and Collateral Professions.* 1894. seventh editions of these useful works have been issued, and since they have been published by Messrs. Kelly & Co., we need hardly say that they are well-edited and well-arranged. Building Trades Directory extends to 2,185 pages, and the Engineers and Iron and Metal Trades Directory approaches nearly 2,000 pages. In the preface to the first work some interesting statistics are given of the number of persons to be employed in the building trades every employment. In London alone the number is stated to be 120,434, compared with the number given in the census returns, shows a reduction in the aggregate of 5,000, the reduction being extended to every trade. Carpenters and joiners are to be reduced in numbers 5,811, while painters and glaziers appear to have increased 4,285. The figures are hardly credible, for while reduction in one trade is capable of explanation, the increase in the other is inexplicable. The number of architects and surveyors practising in London is given in the Directory as 1,271 respectively. Other statistics of interesting character are given in the preface, being made to the severe depression since the last edition of the work was published (1890)—a depression which affected the iron trades, but not so severely, however, as other industries. The Directory includes lists of the Metropolitan Vestries, with various officers, County and Borough Surveys, and other official information, though we find that a former suggestion of ours has not been adopted—viz., to incorporate in the new pages devoted to lists of the Architectural Societies, the Master Builders' Association, and the principal trade unions connected with the building trades, with names of the principal officers and statistics of membership. But, to have before the public the work is both of an alive and reliable character. The same remarks apply to the Engineers and Iron and Metal Trades Directory, both, so far as management and arrangement are concerned, being similar in character, though this work is more freely interspersed with advertisements than the Building Trades Directory. The Directory gives lists of all the various trades connected with metal or having connexion with or affinity to engineering, and contains an interesting preface.

## NEW DIRECTORIES.

twelfth edition of "The Railway and Commercial Gazetteer of England, Scotland, and Ireland" (London: McCorquodale & Co., and Simpkin, Marshall, Hamilton, Kent & Co., Limited; and W. J. Adams & Co.), has been sent to us, and like previous issues, it is to be thoroughly reliable. The railway

information, conveyance groups, population from last census (1891), and postal intelligence, have been revised and corrected to present date, and the book purports to contain a complete list, arranged in alphabetical order, of every city, town, village, parish or township, and place in Great Britain—over 40,000—showing the distance from London to each, with through rate routes, also line of railway, locality, population from last census (1891), nearest station, distance from station, post offices, money order offices, and telegraphic offices. No pains seem to have been spared to make the work as complete as possible, although one could wish that where there are two or more railways running into a town, some method had been adopted for showing whether they have the same terminus or are situated in different parts of the town. We hope this information will be given in a future edition. The last edition of the work has been in constant use by us, and we have never looked in vain for the information which we have required. It must be an indispensable work in all large offices.—We have received from Mr. Henry Sell, of 167, Fleet-street, a directory of registered telegraphic addresses. Mr. Sell, in the preface to the work, informs his readers that it was in consequence of dissatisfaction felt amongst commercial men at not being able to get any information from the Post Office as to the senders of telegrams when signed by a registered code-word, and also as to what was the code-word of a firm with which they wished to communicate, that he determined to supply what business men required. The first section of the directory gives a list of London and provincial firms arranged in alphabetical order, and the telegraphic addresses opposite, and the second part is devoted to the telegraphic addresses with figures opposite corresponding to the page where the full address may be found. This is a very good arrangement, and the work is likely to be of great service to business people. The compiler suggests that the code-word "Quaintness" should be used to indicate that the preceding name in the message is the registered telegraphic address as printed in this directory.

### Correspondence.

*To the Editor of THE BUILDER.*

WHICH IS THE BEST BRICK?

SIR,—I have been a constant reader of your paper for over twenty years. From it I have obtained much profit and instruction. Will you therefore allow me to introduce a question which I think of great interest and importance to the architects, engineers, builders, and inhabitants of London, and that is—which is the best brick to use in London? By best brick I mean the one that—

- a. Can be obtained at a price which will enable it to be used generally.
- b. Will give such price will do the best work.
- c. Will stand the greatest pressure.
- d. Will withstand the atmospheric conditions peculiar to London.
- e. Will absorb the minimum of moisture and so prevent damp.
- f. Will be suitable for facing, and what after the experience of the late great fire in St. Mary Axe we know to be of the utmost importance,

There is no need to prove the importance of the subject when it is remembered that upwards of 700 millions of ordinary building bricks are used in London every year. It must be evident to every one that it is very desirable that the best bricks only should be used.

Roughly speaking, the bricks used in London may be classified under the following heads:

1. The bricks from the alluvial deposits above the chalk, made by hand and burnt in clamps—commonly called stock bricks.

2. The bricks from the gault, made by machinery and burnt in kilns—called gault bricks.

3. The bricks from the Kimmeridge clay, made by machinery and burnt in kilns—called Fletton or Peterborough bricks.

4. The bricks from the Leicestershire coal measures, made by machinery and burnt in kilns—called Leicester bricks.

Up to a few years ago the number one or stock brick was the only brick used in London. Then came in number two, or the gault brick, and in the past few years came numbers three and four.

As far as I know, stock bricks were originally made in Middlesex, near Cowley, whence is derived the name "Cowley Grey;" then they were made in Kent, particularly in the neighbourhood of Sittingbourne; and latterly in Essex.

Gault bricks were originally made in the neighbourhood of Burham and Aylesford in Kent, and afterwards in much larger quantities in the neighbourhood of Arlesey in Bedfordshire.

Fletton bricks have rather a curious history. When there was such a scarcity of bricks—1877-79—workers resorted at Fletton, near Peterborough. The top or plastic clay on top was used, the clay underneath, called "knots," being then considered of no value for brickmaking purposes. Experiments were afterwards tried with the knots, and it was found that with improved machinery semi-dry bricks could be manufactured. Old works have been extended, new works have been started, and now the Fletton bricks are a very important factor in the supply of the London market.

Leicestershire bricks are red in colour, and at present, at any rate, do not come largely into London.

Let us compare the merits of these different bricks.

Stock bricks are under a cloud. A new generation of architects and engineers has arisen, who will not have them, preferring machine-made bricks. Country builders, who during the last few years have done so much work in London, dislike them, and scientific men condemn them. They certainly are brittle, have noarris, chip very much, are often irregularly burnt and discoloured, and are not fit for the job. It is not look in such good condition as a machine-made brick. On the other hand, they do very good work. Let any architect or engineer, enamoured of a machine brick, inspect stock brick work such as he can find, say, in New Broad-street, or at some of the squares near Covent Garden, and he must be struck by the goodness of the brickwork. They are absolutely necessary to give the peculiar atmospheric conditions of London. When pointed and cleaned they are as good as new, and will outlast the sham stone facings of the large buildings in London, all the machine-made bricks, and perhaps even terra-cotta. The stock bricks, like the stone, are a thoroughly plastic brick, and it is an error to say that they are nearer the clay approaches a plastic condition when moulded into bricks, the better the brick. The machine-made bricks are not thoroughly plastic; in fact, the Peterboro' bricks are not plastic at all. A stock brick is thoroughly vitrified, containing its full complement, and a large percentage of chalk, which acts as a flux, and the same way as limestone does in blast-furnaces, so that every element is fused into one entire whole.

The machine brick is simply baked. The importance of this point is immense.

The stock brick is practically a fire brick. It contains a very large percentage of silica, much greater than either the Peterboro' gault or Leicester brick. Having been thoroughly vitrified it will stand the heat of any ordinary fire. Machine bricks, particularly the gault and Peterboro', will not; they burst and fall to pieces.

When laid, the stock makes a homogeneous whole. Stock brick work laid with cement cannot be taken down, it must be blown down. Machine-made bricks can be taken down as they were laid.

*Machine-made Bricks.*—Of these the most important are the Peterboro' or Fletton bricks. They are now the rage. The engineers of the large railway extensions on the Great Northern and South-Eastern Railways will have nothing else. They have been specified for Government works, and nearly the whole School Board have adopted them. They are not so good as the old ones, there is little or no waste, the bricklayer gets them quickly and easily, they have a smooth surface, they are well glazed, and they will stand a very great crushing strain. On the other hand, they are made in a semi-dry condition, and will not stand the weather. They are baked, not vitrified, and, unlike the stock, will not stand fire. They absorb an enormous amount of water. A good comparison of the two classes of bricks may be seen—the Fletton brick in the Great Northern Works, and the Peterboro' brick against the stock brick in the Tottenham and Forest Gate railway. The stock brick works is quite as good as the Fletton, while as to durability the stock brick is beyond comparison.

**Gault Bricks.**—These were originally made for paving, but they suffer from the defect of staining on vegetation. They are now used as a common building brick. They have been very largely used in public buildings. They are more brittle than the best building brick, and are liable to fly and chip. They will not stand fire, and how they could have been allowed to be used in such public buildings as the new Admiralty buildings, the new Post Office, and more especially the National Gallery extension and the Public Record Office is a matter of great surprise to me. If ever a fire happens in these buildings, the public will regret that a Gault brick was ever allowed to be used.

As to the Leicestershire bricks there is not much say. To a great extent the same remarks as toault and Fletton bricks apply to them.

With a knowledge of all four classes of bricks, I personally prefer the stock brick. In my opinion, it makes better work, it will stand the London atmosphere, for facing it is superior, and being practically a fire-brick and thoroughly vitrified, it will stand the fire where its competitors would disappear.

The matter is of such great importance that it would be of inestimable advantage to have a discussion upon it in your columns.

A LOVER OF A GOOD BRICK.



### "SANDOWN" CASTLE.

SIR,—This structure, when erected on the wind-driven sand-dunes fronting Sandwich, was situated northward of "Shingle End," the termination, at that period, of this great Channel pebble belt, travelling upwards or to leeward as regards the prevailing south-west winds.

Some forty years back extended inquiries were made for Her Majesty's War Department, when the late Benjamin Hawes was Secretary for War. The information collected was printed and circulated amongst the owners of frontages affected, but no concerted action could be obtained for the necessary protection to check the great erosion north of Deal, at that time caused by the stoppage of the normal travel leeward of the shingle up Channel, due to several years' exceptional prevalence of easterly winds, as shown by the journals kept by the Trinity Corporation at the neighbouring light stations; and as the frontage of the War Department was limited, any large outlay was abandoned, as also the carrying out of any work for the protection alone of the Castle, at first entertained but ultimately put aside also.

Subsequently, when Sidney Herbert was War Minister, it was determined to abandon the Castle altogether as a military post.

Abandonment was easy; demolition more difficult; as proved even now by the efforts recently made to get rid of the remaining outlying portions.

I urged at the time that such a step might hereafter be regretted, and I still hold to that opinion, regarding it as a work assisting in the conservation of the shore, and great care, doubtless, has been exercised that the sub-structural portions which form a groyne for the retention of the travelling foreshore material, forming the defence of the northern portion of Deal, should not be removed.

It was then, as now, urged that as a military work it was chiefly remarkable as the prison of Colonel Hutchinson during the Civil War, but the monogram of the great Cecil, Elizabeth's trusted Minister, on the abutment of the draw-bridge, shows plainly enough the importance attached to it at that glorious period.

Deal, Walmer, and the other stone castles of Henry the Eighth are all on one uniform plan—a large circular main tower, surrounded by a deep fosse and four subsidiary outlying towers as the cardinal points, the main tower encircled by a subterranean arched passage with casemates commanding the fosse.

The geometric accuracy and beauty of the masonic work are marvellous, and would put to shame much of our modern vaunted handicraft work.

In the celebrated "Burling Book" in the King's Library at the British Museum these works are depicted on vellum with rare beauty, showing that the draughtsmen were as able as the masons who carried them out, and the whole volume is evidence that the monarch and statesmen of the Elizabethan Age were as anxiously foreseeing respecting the vast importance of every effort to conserve our insular maritime supremacy as their descendants can be in the Victorian Age.

Dymchurch Wall and the neighbouring shore have suffered much in the recent gales, but the plight of the former work can hardly be worse than what it was in just over half a century back, when the plan and sections made by me at that period, when Sir Edward Knatchbull was chairman of the Romney Marsh Commissioners, were hung up, and remained for many years in their meeting-room at New Hall, Dymchurch.

The large outlay contemplated by some as necessary would hardly meet with much assistance if the value of the "Great Redoubt" is assessed by the War Office on the same principle as at Sandown Castle—i.e., its extent of sea frontage defence as compared with the whole shore affected.

J. B. REDMAN, M.Inst.C.E.

### BOILER EXPLOSIONS.

SIR,—In his letter on page 241, Mr. Francis E. Jones condemns the use of the hot-water cylinder in connexion with the kitchen boiler, but he gives no sensible reason for so doing. With the cylinder, especially if large enough, it takes longer to cause the water to boil. Also when the water gets warm it takes longer to cool a large body than a small. Further, the warmer portion of the water rises to the top, hence if the expansion-pipe rises upwards in every part of its course from the cylinder it requires the fire to be off a long time before the expansion-pipe can freeze.

It often happens, however, that the expansion-pipe is not put up properly at first, and not fixed securely so as to always have a rise upwards in all its course, hence a check is put to the easy rise of the warm water in the expansion-pipe, and its unnecessary greater liability to freeze.

The supply and expansion pipes to and from the boiler and cylinder should be wrapped with felt, so as to help to prevent freezing. Were this often done and greater attention paid to the rise upwards of the expansion-pipe in all its course many explosions might never have occurred.

The double pipes between the cylinder and the boiler should give greater safety, not extra danger, as Mr. Jones insinuates.

A safety-valve on the cylinder would tend greatly to prevent explosions.

To cause explosion a little portion of the water frozen in both the supply and expansion pipes is all that is necessary, if fire is kept up with those pipes partly frozen, for then the steam cannot get away.

W. P. BUCHAN.

### The Student's Column.

#### THE STRUCTURE AND PHYSICAL PROPERTIES OF BUILDING STONES.—XIII.

##### DISTRIBUTION OF ENGLISH OOLITES.

THE whole of the Oolitic limestones raised in this country, and a great number of shelly limestones also, are found within the dotted zone delineated on the accompanying map (fig. 13). The numbers therein, refer to

These quarries may be divided into two groups according as they are situated on the Purbeck Portland beds, and the stone is capable of a separation. Referring to the former group, we may say there are about fifty quarries in Purbeckian of the district extending from Swan to beyond and north of Langton. They are chiefly small workings, employing altogether close up 200 men, and, in addition, 100 men are engaged as masons. All the quarries are in reality not 60 ft. or thereabouts from the surface, worked means of an inclined shaft, the stone being up by a horse-windlass. We descended into certain of these mines, and ascertained that the men frequently to work in a stooping posture, or lying on the wet ground, whereby they contract rheumatism. To quote the words of a middle-aged quarryman:—"My health has been ruined by underground work in these quarries."



Fig. 13.—Map of England and Wales, showing distribution of Oolite.

districts where the stone is actively exploited, and may be defined as follows:—

1. Purbeck, 2. Portland, 3. Tisbury, 4. Ham Hill, 5. Doulting, 6. Bath, 7. Cotteswolds, 8. Oxford, 9. Kettering, 10. Stamford, 11. Ancaster, 12. Yorkshire.

#### 1.—THE PURBECK DISTRICT.

The building, paving, and kerbing stones quarried in the Isle of Purbeck come from the Purbeckian and Portlandian series. The following sketch-map indicates the sites of the various workings:—

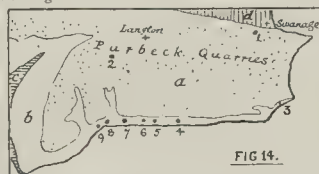


Fig. 14.—Geological Map of part of the Isle of Purbeck, showing sites of Quarries.  
d - Wealden beds, a - Purbeckian, b - Portlandian, c - Kimmeridgian.

and, in consequence, I am made an old before my time." Candles are the only lanterns used. Quarrymen employed underground are paid by the day; masons above by piecework. There are no trades unions.

It would serve no useful purpose for us to describe each of these small workings; the following generalised section shows the workable beds in order of their occurrence. It will be understood that these beds are worked in any one quarry, but that the information is derived from several:—

#### Generalised Section of Quarried Purbeckian the Isle of Purbeck.

- Rubble and odd stone (not worked)
- "Laning Vein." Yellowish grey limestone, large shells in layers, and very hard
- Clay parting.
- "Roach." Grey, hard, laminated, shelly limestone; used for flagging
- Clay parting.
- "Grey" bed. Light blue, hard, shelly limestone; used as steps for cottages, &c.
- "Thornback" bed. Dark grey, very fine-grained, and hard enough to be



polished; used for caps, kerbing, bed-stone, &c.	ft. in.
Parbeck freestone. White, grain so fine as to be hardly visible; used for general building purposes, mouldings, &c. This will be described in detail later on	0 10
and rubble beds (not worked).	2 0
Downs Vein. Grey, shelly limestone; used for paving	4 0
bed.	
Cinder stone (not worked).	4 0
bed.	
Cap and Feather bed. Light brown, fine-grained, irregularly-fractured limestone; used for kerbing	4 0
New Vein. Very hard limestone; used for steps, paving, square landings, &c. Stones 5 ft. to 6 ft. square, and larger	4 0
Total thickness worked	20 2

the freestone is said to have a "bed" in it, we discovered that in this district quarries have a "bed" any plane along which the stone splits, and that there is no real bed or zonal joint in it. Judging from the readiness with which large flakes were detached by masons, came to the conclusion that, although hard, it is somewhat brittle. Thin calcite veins run through the blocks here and there, but do not act from the value of the material. The free- does not apparently "vegetate," and keeps colour well.

The following sketch (fig. 15) illustrates the

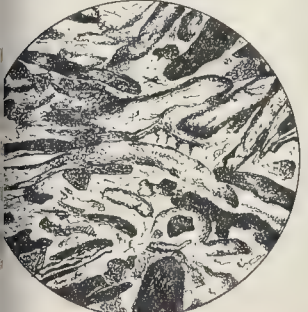


FIG 15.

Micro-structure of Parbeck Freestone. (x 40).

Micro-structure of Purbeck freestone, obtained at the point marked 1 on the map (fig. 14). It is made almost entirely of shelly material, indicated by the long, irregular fragments, cemented together by calcite in a more or less granular con- texture, and having a certain amount of secondary quartz or flint distributed amongst it. The shells signs of having been partially decomposed and re-cemented. Quartz grains very rare. Micro-examination of a sample of the Purbeck stone from point 2 (fig. 14) shows that the e is finer grained, matrix more granular, and quartz grains (sand) fairly abundant.

The "Thornback" bed, so largely used for kerbing, differs in structure (fig. 16)

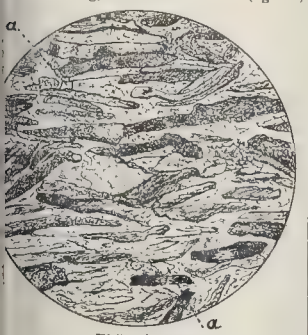


FIG 16.

Micro-structure of Purbeck stone ("Thornback" Bed). (x 40).

a, a = Quartz grains.

from the freestone, amongst other things that it contains much more quartzose sand, has not such a granular matrix, whilst the shelly matter is more comminuted and fresher.

# GENERAL BUILDING NEWS.

**PROPOSED RECONSTRUCTION OF STAFFORDSHIRE GENERAL INFIRMARY.**—A special meeting at the Staffordshire General Infirmary was held recently, when the Earl of Harrowby, the chairman, said he had no hesitation in recommending that the Building Committee should at once proceed to reconstruct the hospital, upon the plans of Mr. Aston Webb. The central portion would remain as the administrative block. The old wards would disappear, and be replaced by a new wing. They would have in the place of the old building a model hospital, equipped fully with every modern appliance. The recommendation was agreed to.

**CO-OPERATIVE PREMISES, TOTTERDOWN.**—New premises have been acquired by the Bedminster Industrial Co-operative Society, Limited, at High-grove-place, Totterdown, and these were opened on the 15th inst. The building consists of basement and ground-floor, and has a frontage in Wells-road of about 46 ft., and a side front in County-street of about 140 ft. The entrances are laid with tessellated tiles, the shop floor being constructed with rather a sharp gradient to avoid steps. The plans and specifications were prepared by Mr. John Reed, and carried out under his supervision. The work was entrusted to Mr. T. Broad, of Totterdown.

**NEW PARISH HALL, CLERKENWELL.**—According to the *Daily News* Mr. Evans-Vaughan, of Louth, Arcade, is appointed architect for the new hall, and the contract for 14,724l. 18s. of Messrs. C. Dearing & Son, of Islington, is accepted. The original estimate of 12,000l. the vestry decided to increase by 910l. for extra cost involved by paying the trade union rate of wages and using English goods.

**SCHOOLS, LANELLY.**—New schools to accommodate 500 children have just been completed for the Lanelly School Board from plans prepared by Mr. J. B. Morgan, of Lanelly, who has also had further instruction from the Board to provide additional accommodation for 500 children.

**CHURCH HALL, SHIPLEY.**—The new Parochial Rooms, or Church Hall, which are the forerunners of the church for the Saltaire end of the parish of Shipley, were recently dedicated. The new buildings are situated off Moorhead-lane, east of the new church site, and contain a central hall and two class-rooms. Messrs. T. H. & F. Healey, of Bradford, have been the architects, and Messrs. Rhodes Brothers the principal contractors.

**NEW INSTITUTE AT BROMSGROVE.**—Mr. Austen Chamberlain, M.P., opened recently the new Institute, on the New-road, Bromsgrove, the foundation-stone of which was laid by Lord Windsor last autumn. The total cost of the new premises is nearly 2,000l. The architect was Mr. John Cotton, late of Bromsgrove, and now of Oxford. The building occupies a site adjoining the Cottage Hospital, and is approached by a flight of steps from the New-road. There is a vestibule and hall about 6 ft. wide. On the left is a reading-room 24 ft. by 18 ft. 6 in., with a segmental bay window; and on the left is the lending library. At the far end of the hall is a lecture-room, which will also be available for gymnasium purposes; the dimensions are about 42 ft. long by 24 ft. 6 in. wide; the roof is open-timbered, and a small retiring room is provided. Upon the first floor above the library and reading-room, are two large rooms for recreation purposes, committee meetings, &c. The premises are built with brick and roofed with tiles, and are relieved by stonework round the entrance and over the windows. The design is of a Gothic type, and the elevation is so arranged that when the new school of Art is erected on the adjoining site, the whole will harmonise. Messrs. Tilt & Weaver, of Bromsgrove, were the builders. Messrs. Griffin Brothers, of Bromsgrove, did the stonework, and Mr. H. H. Martin, of Cheltenham, the carving from the architect's sketches and instructions.

**ALTERATIONS TO LOSTWITHIEL CHURCH, CORNWALL.**—Lostwithiel parish church, says the *Western Morning News*, undergoing considerable alterations. The clergy and choir vestry immediately behind the organ, in the north aisle, was very inconvenient, and for the enlargement of the organ this space was required. The most suitable site for the new vestry was found to be in the north-west corner under the spire. Mr. J. Stephens is doing the masonry, and Mr. J. Rundle the carpentry. Mr. E. Sedding, of Plymouth, is the architect. The vestry will cost about 200l. When it is finished the north-west arch of the spire, which has been blocked, will be opened, so that the way from the vestry into the church will be through the belfry to the central aisle. What was in past years known as St. George's Chapel, situated at the south-east corner of the church, is being restored.

**MUNICIPAL BUILDINGS, COATBRIDGE, LANARKSHIRE.**—On the 26th inst. Mr. Graeme A. Whitelaw, M.P., laid the memorial stone of the new municipal buildings of Coatbridge. Mr. A. McGregor Mitchell, Burgh Engineer, is the architect of the buildings.

**ALTERATIONS TO WESLEYAN CHAPEL, LELANT, CORNWALL.**—Lelant Wesleyan Chapel was rededicated on Good Friday after alterations. The entrance lobby is now approached by granite steps, and the floor is laid with tessellated pavement. The lobby screen is of pitch-pine moulded panels. The chapel is fitted with pitch-pine benches, with sloped backs. The gallery is reslated to correspond with the body of the chapel. The orchestra is entirely new, and forms an apse in the east end. The decorations have been carried out by Mr. Richards, of St. Ives. The contractor is Mr. Glasson, Curbes Water, who sublet the mason work to Mr. Fox, of Goldsithney. Mr. O. Caldwell, Penzance, is the architect.

**NEW BANK PREMISES AT YORK.**—New premises for the York branch of the National and Provincial Bank of England have been erected at the corner of Market-street and Spurrier-gate, York. A considerable widening of the narrow roadway has been effected by setting back the building line. The front elevations are of Pateley Bridge stone, and the banking-room occupies most of the ground floor. Provision is made for both gas and electric lighting. The building is Classic in design, and has been constructed entirely to the plans prepared by Mr. G. H. Gribble, architect, London. Mr. T. P. Barry, of York, was the contractor; and Mr. Edward Grimes, clerk of works.

**THE RESTORATION OF ARBROATH PARISH CHURCH.**—A meeting of the joint-committee for the restoration of the Old Church of Arbroath, destroyed by fire about eighteen months ago, was held on the 21st inst. Mr. Burnett, architect, Glasgow, submitted tenders for the rebuilding of the church according to plans prepared by him. Tenders to the total amount of over 6,000l. were accepted. The work is to be proceeded with immediately. The church spire, which was not damaged by the conflagration, will form a corner tower to the new building.

**BAPTIST CHAPEL, BEDFORD.**—On the 21st inst. the foundation-stones of the new Providence Baptist Chapel in Rothsay-road, Bedford, were laid. The length of the chapel will be 77 ft., and its width is 44 ft. 6 in., but there is also a building in the rear, containing on the ground floor a vestry, lobby, hall, committee room and two class-rooms. On the floor above there will be one schoolroom, 41 ft. 6 in. by 27 ft., with a height of 24 ft. The front elevation of the chapel faces Rothsay-road. Within, there will be a pulpit and baptistry at one end, a gallery at the other, and seating accommodation for about 550. Messrs. Usher & Anthony, of Bedford, are the architects, and Messrs. Melcombe Bros. are the contractors, also of Bedford.

**ADDITIONS TO ST. PETER'S CHURCH, FOLKESTONE, KENT.**—The chancel and side chapel of this church was reopened at Easter, upon the completion of some decorations which have been in course of execution for several weeks past. They consist of the erection of carved and traceried oak-work, which covers the walls of the chancel and side chapel, and consists of wall panellings, canopied choir-stalls, sedilia, credence, doors and their surroundings, and an altar-piece to the side chapel, with a folding triptych as a central feature, and the part above carried to a considerable height, and terminating beneath the roof-plate in a coved canopy. The whole is carried out in oak in the style of the end of the fifteenth century, and has cost about 1,000l., defrayed out of the estate of the late Miss Phillips, of Leamington. The work has been executed by Mr. Richard Bowen, of Leamington, from the designs and under the supervision of Mr. Slingsby-Stallwood, F.S.A., of Reading.

**PROPOSED WESLEYAN CHAPEL, WOLSTANTON.**—A new Wesleyan Chapel is about to be erected at Wolstanton, Staffordshire, the architect being Mr. A. R. Wood, of Tunstall, whose design has been selected in a limited competition.

**PROPOSED CONSERVATIVE CLUB, CHATHAM.**—The Executive Committee of the Conservative party of Chatham have decided to recommend the purchase of a site for the erection of a new club, and have instructed Mr. G. E. Bond, architect, to prepare plans for the building.

## SANITARY AND ENGINEERING NEWS.

**SEWERAGE SYSTEM, MANCHESTER.**—Mr. T. Codrington, Local Government Board Inspector, held an inquiry at Manchester on the 15th inst. with respect to an application by the Corporation to borrow 100,000l. to complete the sewerage system started in the city some years ago.—Dr. Pankhurst, for the Corporation, said that under an order made in 1895 an area of 6,950 acres had been added to the city, and the population upon it would soon reach 165,000. It was necessary to make provision for the added districts. Formal evidence was given, and the inquiry was closed.

**SEWERAGE WORKS, WIMBLEDON.**—On the 21st inst., Colonel John Ord Hasted, R.E., Inspector of the Local Government Board, held an inquiry in respect of the application of the Wimbledon Local Board to borrow 1,650l. for works of sewerage and sewage disposal, in accordance with plans prepared by Mr. C. H. Cooper, Engineer and Surveyor to the Board, and 825l. for the purchase of land for additions to the recreation ground. The works of sewerage



include a small scheme for the drainage of the north-eastern portion of the district, which is at too low a level to gravitate to the sewage works. It is proposed to raise the sewage of this district by means of two small Shone's ejectors, worked by compressed air, after the same has already done duty in pressing sludge at the sewage works. The works of sewage disposal relate to the high-level filters, which at present cannot be worked alternately, and are, therefore, constantly submerged, so as to prevent nitrification taking place. It is proposed to alter these filters so that they can be used alternately, and allow one filter to aerate while the other is in use for the filtration of sewage.

**SEWAGE SCHEME, STOCKPORT.**—On the 17th inst. the Mayor of Stockport (Mr. John Turner) cut the first sod, and Mr. Alderman W. Lees, chairman of the Sewage Outfall Committee, laid the first stone of the works at Cheadle Heath, connected with the scheme for intercepting and purifying the sewage of the borough of Stockport. The scheme, which is that of Mr. A. M. Fowler, of Manchester, formerly Borough Surveyor of Stockport, is designed to deal with the whole sewage of the borough and the out-townships immediately adjoining. The sewage of the borough is to be intercepted, and, along with a portion of the heavy rainfall which passes through the sewers, is to be prevented from entering the River Mersey. The whole volume of these sections is to be passed through one arterial sewer, so as to secure, even in times of prolonged drought, a velocity sufficient to keep the sewer self-cleansing. The area of the borough of Stockport is 2,167 acres, and its population is 72,053; and the scheme is calculated to meet the combined requirements of that area and the townships already referred to for many years to come. The total length of the intercepting sewers will be about 4½ miles, and the main sewer will be built of brickwork of such a form and inclination as to ensure a velocity of upwards of 2 ft. per second and of varying diameter, with a maximum of 7 ft. and a minimum of about 16 in. The underground work will be partly through gravel, but principally through rock, and will be generally 40 ft., and in many places as much as 60 ft. below the surface. The main sewer will be ventilated throughout its entire length, and will always be accessible and under complete inspection. Out at Cheadle Heath, on the left bank of the Mersey, and in immediate proximity to the stream, the sewage will be dealt with by being pumped to a height of 17 ft., there to be incorporated with the precipitating medium which will throw down the solids. It will then pass into eight tanks, where the mud will be intercepted, and the effluent therefrom will be passed on to and over about 63 acres of land, and there allowed to rest at intermittent periods. The land will be under-drained, so that the water will fall into the river in, it is claimed, a clear condition. The buildings upon the site will consist of a pumping-house to contain the necessary motive power, processes for pressing the mud into cakes, and rooms for grinding the chemicals for treating the sewage. It is estimated that the works will cost 95,000l., exclusive of the land.

**LANDING-STAGE IMPROVEMENTS AT LIVERPOOL.**—At the meeting of the Mersey Docks and Harbour Board, on the 22nd inst., a recommendation of the Works Committee to provide additional landing and railway accommodation at the north end of the Prince's Landing-stage, for the coastwise, cattle, and goods traffic, at an estimated cost of 120,000l., came up for consideration. The alterations contemplated are an extension northwards of the Prince's Landing-stage for a length of 400 ft., a new jetty from the south side of the south entrance to the Prince's Half-tide Dock to the north end of the floating landing-stage, as extended, a bridge to connect the said stage and jetty, a platform supported on piles in a portion of the space between the landing-stage, as extended, and the river wall, and railway lines in connexion with the proposed jetty, and having a junction with the dock lines of railway across a new bridge to be provided over the passage between the Prince's Dock and Half-tide Dock. The Board confirmed the recommendation unanimously.

**SEWAGE SCHEME, ASHTON-UNDER-LYNE.**—Colonel Ducat, R.E., Inspector to the Local Government Board, held an inquiry last week at the Ashton Town Hall for a loan of 45,000l. to carry out sewage purification works. Mr. Shee, Q.C., and Mr. Mattinson, appeared in support of the Corporation. By this scheme it is proposed to purify and deal with the sewage of Ashton, Hurst, Littlemoss, and Tanton. The scheme was opposed by the Dukinfield and Audenshaw Local Boards, not on the grounds of inefficiency, but on account of Ashton wishing to take its sewage into another county. The system intended to be adopted is that known as the International process. The inquiry lasted for five days, and was of some importance, as it will probably settle the question whether or not public authorities will in the future be permitted by the Local Board to take their sewage into a neighbouring county for treatment.

#### STAINED GLASS AND DECORATION.

**WINDOW, NORTON LINDSEY, WARWICKSHIRE.**—The three-light window on the south side of the nave of Norton Lindsey Church has just been filled

with stained glass, the subject of the Crucifixion being taken across the entire window, which has been designed and executed by Messrs. F. Holt & Co., of Warwick.

**MEMORIAL WINDOWS, ST. ANDREW'S CHURCH, BRADFORD.**—On the 17th inst. three memorial windows in St. Andrew's Church, Listerhills, Bradford, were unveiled by the Rev. Canon Bardsley, D.D., Vicar of Bradford. The windows have been executed in the fifteenth-century style by Messrs. Powell Bros., Leeds.

#### FOREIGN AND COLONIAL.

**FRANCE.**—M. Olivier Merson has been appointed professor of drawing at the École des Beaux-Arts, in place of M. Joseph Blanc, who has undertaken other duties. M. Ernest Barrias is appointed chief professor in the atelier of sculpture, in place of the late M. Cavelier. The inauguration of the monument to Barye will take place on June 15, under the presidency of M. Guillaume, director of the École Française at Rome. There is talk of cleaning and restoring the large frescoes in Grissaille by Abel de Fajol, in the Bourse at Paris. The municipality of Peronne have opened a competition for a monument to a nearly-forgotten heroine, Marie Fourré, who, in the sixteenth century, saved Peronne when it was besieged by Henri of Nassau. M. L. Ruse, architect, of Paris, has given the sum to be expended in premiums. A bust of La Fontaine, by M. Louis Noël, is to be inaugurated on June 24 at Fontenay-aux-Roses. The State has just purchased the church of St. Laurent at Rouen, an interesting example of the architecture of the fifteenth century, which had passed into the hands of a private owner who wished to pull down the nave in order to build a house on the site, preserving only the entrance-door and tower of the ancient church. The building thus rescued is to be classed among the "Monuments Historiques." M. Alesmonieres, engineer, of Thonon, has obtained the first premium in a competition opened by the municipality of Evian for sanitation works in that town, including water supply and the construction of public drinking fountains. The second premium has been awarded to M. Goupil, architect, of Narbonne, and the third to M. Masson, engineer, of Paris. A monument to Dupré, the eminent landscape-painter, is to be placed on the Ile Adam. It will be completed in June.—The death is announced, at the age of sixty-four, of the landscape-painter Felix Bernard, pupil of Hippolyte Landrin. He carried off the Prix de Rome for landscape in 1854.—M. Louis Cardon, editor of the *Évenement*, is dead at the age of thirty-three. He was one of the youngest and at the same time one of the best art-critics on the Parisian Press.—The widow of the eminent sculptor Carpeaux is organising an exhibition of the works of her late husband, to be held from May 10 to 25, at the École des Beaux-Arts. The exhibition will include, besides sculpture, a number of drawings, paintings, portraits, and some very curious sketches and studies of the court of Napoleon III.—A subscription has been opened at Moulins to raise, in that town, a monument to the poet Théodore de Banville.—Mme. Rosa Bonheur has been made "officer" of the Legion of Honour. She had a long time since received the cross of "chevalier."—The title of chevalier has been conferred on M. Frantz Jourdain, a member of the Société Centrale des Architectes.—The construction of the large intercepting sewer at Asnières has led to the discovery of a subterranean passage, vaulted in stone, five kilometres long, and which forms a communication between Asnières and the cellars of the ancient château of Gennevilliers. Its existence was quite unknown to archaeologists who have interested themselves in the history of the château. It is supposed to have been constructed in the time of Louis XV.—The rebuilding of the Pont de Neuilly, which has been considerably enlarged, has just been completed.

**GERMANY.**—The conditions of the competition for the Emperor's "Classic Art" prize are now published. The competition is limited to German subjects, and the sending-in day will be in December. The Emperor himself will act as sole adjudicator.

The monument to Emperor William I. on the Kyffhäuser is to be completed by May 10, 1895, which is the twenty-fifth anniversary of the conclusion of the Peace of Frankfurt. The total cost will be about 45,000l., of which nearly 13,000l. has still to be subscribed.—The result of the competition for this year's Schinkel commemoration prizes was recently announced at the general meeting of the Architekten Verein. In the Architectural section, where a design for a club house was the subject, two only, of the seven plans sent in, were adjudged worthy of distinction, Herr Hennig taking the prize and Herr Körner the medal. In the Engineering section the subject was a canal swing-bridge. Three designs were received, and Herr Skalweit was awarded the first premium. At the Berlin Art Exhibition, which opens on May 3, "Arts and Crafts" will be well represented, especially gold and silversmiths' work and wood-carving. The Carlsruhe artists have sent in nearly fifty

pictures.—The Society of Lady Artists opened their exhibition at the Academy of Arts last week. The jury, it is worth noting, is exclusively composed of artists of the other sex.—The Municipal "Special Commission" appointed to act in conjunction with the executive of the Berlin Exhibition of 1896 has decided to invite the members of the Works Committee to a conference with a view to settling the scope of the exhibition.—1,000l. has already been subscribed towards proposed Siemens monument at Berlin.—The proposals for the Dortmund and Rhine Canal came before the Prussian Diet after the Easter recess. The cost of the undertaking (approximately 3,000,000l.) and the powerful interests in opposition to the scheme, render its acceptance doubtful.—Herr Karl Gries, an architect, who, strange to say, in the course of his practice, has accumulated a large fortune, has just made the City of Munich a gift of some house property, valued at about 75,000l. The property is to be sold and the money spent on some new baths and washhouses. Herr Gries is now in his seventy-fourth year, and is well known for his philanthropic work.—The historical Römer building at Frankfurt is to be sold at a cost of over 18,000l. The original design of Herr Meckel, who took the first premium in the competition some five years back, had to be modified to almost half its extent.—The very successful results of the excavations undertaken by the German Archaeological Institute at Athens have induced the Greek Government to purchase the land on the western side of the Acropolis, with a view to further investigations.—At a recent meeting of the Archaeological Society, Messrs. Kekule and Kern lectured on the excavations undertaken by the executive of the Royal Museums at Magnesia on the Meander. Work went on from March, 1891, to July, 1893, under the direction of Herr Humann, the principal discovery being the Temple of Artemis, the Apollon, and the Temple of Zeus Sopolis.—The architect Bernhard Schreiber has died at Dresden. He was an honorary member of the Dresden Academy of Arts. His chief work is the Court Theatre at Neustadt.—Professor Hoffmeister, one of the most promising of the younger Berlin sculptors, has died at the age of forty-four. He was born at Potsdam, and studied at the Berlin Academy. His chief works are a fountain at Erfurt, designed in conjunction with architect Stockhardt, and the Hausmann monument at Aix-la-Chapelle.

**AUSTRIA.**—The works on the new Hofburg Vienna will be proceeded with as soon as the weather permits. By the end of the building year is intended to attain to the roof level, and to resume the construction of the connecting wing to the Old Palace for 1895, when a commencement will also be made on the internal arrangements. The Royal apartments are to be ready for occupation in 1900.—Vienna is to have yet another new theatre, to be built on the "Landstrasse" quarter. The building will have 2,000 seats, and will cost half a million florins. The architects will be Messrs. Fellner and Helmer.

**SPAIN.**—There is to be yet another "International" Exhibition this year, at Madrid, from June 1 to October 31, under the patronage of the Queen Regent. There will be an International Committee, and the usual facilities as to customs, duties, and freights will be afforded to exhibitors. The following are the different sections:—1. Liberal Arts; 2. Hygiene, Sports and Pastimes; 3. Chemical Industries; 4. Arts and Crafts Furniture; 5. Devotional Attributes; 6. Textile Industries; 7. Metallurgy; 8. Engineering, Architecture, and Public Works; 9. Machinery; 10. Electricity; 11. Transport and Exchange; 12. Art of Nourishment; 13. Agriculture; 14. Miscellaneous. An International Jury will adjudicate.

**DENMARK.**—The decorations in the Marble Church, Copenhagen, are now rapidly approaching completion. The Italian workmen have finished the polishing of the mosaic floor, the heating apparatus has been installed and works satisfactory. The main entrances are now being completed, and it is expected that the church will be consecrated in Whitensund. A new communal school has been completed at Frederiksberg, the cost being 53,000kr., and the architect is Herr Holck.—It has been decided to erect a museum for antiquities at Hjørring.—The Copenhagen Municipality has determined to form the district around the F. Harbour, now being constructed, into a separate quarter of the city, to be called the "Free Harbour Quarter." In this quarter buildings are springing up in all directions. It has been decided to rebuild the ancient Vallø Castle, burned down some time ago, under the guidance of Professor Hans J. Holm. The original castle was built some 300 years ago, and the structure will be in the same style. The course of the restoration of Helligaarde Kirke or Church of the Holy Ghost, the old building in Copenhagen, some interesting coveries have been made. In 1728 the building was partly destroyed by fire, and by knocking the stucco it has been discovered that whilst the original building was constructed of large red brick so-called "monk" stones, yellow "Fleurbaey"



has been used in the restoration. Moreover, removing the stucco from the piers in the ch. it has been discovered that they are really some square polished columns, which have enclosed within a foot of the brickwork. The floor of large red tiles has been found below the present one. Below are extensive vaults. The building will be restored exactly accordance with the appearance of the original edifice was in the Middle Age one of the most brilliant monasteries and hospices in Denmark. Work is being conducted by Professor Storck, the cost will at least be 100,000 kr.—An estimate has just been published in Copenhagen upon the buildings of the Danish provincial, with illustrations and plans. The buildings, which are three, are undoubtedly the most original in Denmark, and modern, having been erected in 1890-93. They are situated in the towns of Viborg (Jutland), Nagen, and Odense (Island of Funen). The cost has been respectively 150,000 kr., 250,000 kr., 140,000 kr.—A great engineering work is in progress in Denmark—viz., the construction new bridge, in place of the wooden one, across broad Guldborg Sound, on the route to the coast. The new bridge will be situated by the old one, and have eighteen piers, consisting of iron cylinders filled with concrete.

RAWAY.—A committee has been formed in for the establishment of a permanent exhibition of arts and industries.—The annual Norwegian Art Exhibition is now open in Christiania.—The Christiania Association of Engineers and Architects has unanimously passed a resolution condemning the present arrangement of technical education, and insisting upon an immediate reform. Several new business premises are being added to the city. The "modern" Christiania is now a huge building in the construction, which Norwegian stables have solely been employed, viz., polished light "Labrador" for the first and second stories, and greyish white for the two upper stories. The architect is H. Nissen.

# MISCELLANEOUS.

LL PAPERS.—Messrs. Jeffrey & Co. will have during April, at their rooms in Essex-street, London, some new designs for wall papers by Mr. Crane, Mr. Sydney Vacher, Mr. Lewis F. Mr. Stephen Webb, Mr. Heywood Sumner, Mr. C. F. A. Voysey.

COVERY OF FRESCO PAINTINGS IN POUGHILL CH.—A few days ago some workmen were employed on interior renovations at Poughill Church, Bude, when traces of fresco paintings were discovered, both in the north and south aisles, and upon a coat of plaster on the walls. That north aisle is a large picture measuring about 9 ft., and is said to be a work of the very part of the sixteenth century. It is a representation of St. Olaf, the patron saint of the church. The fresco abounds in marvellous detail, the cliffs, fish, mermaid, and men in a boat in rowing, being all clearly depicted. The border of the painting is about 9 in. wide, and bears a resemblance to the carved borders to be found on the ends of the church, also the work of this period. The fresco in the south aisle is about 4 ft., and is a representation of St. Christopher. The fresco is also full of detail. The representation of the old legend, it represents the upholding the universe, and in the act of carrying Lord across the water. Other children are depicted as awaiting the saint's care, and the saint stands out prominently with her hand outstretched to light the way.

SANITARY INSTITUTE.—At an examination of papers of Nuisances, held at Nottingham, on Saturday, March 16 and 17, thirty-three candidates presented themselves. The following candidates were certified, as regards their knowledge, competent to discharge the duties of Inspectors of Nuisances:—Ball, James; Buxton, Davis; George Walter, Stuyfman; Mansfield; Forster, John Smith; Stockport, W. Frederick William; Nottingham, Granger; Nottingham, Hawley; George William; Nottingham, Hughes; Albert Frederick, Rhoddu; Nottingham, Jackson; Leonard Labrey; Garsington; Levy, Jacob; Nottingham; Oliver; Hudson, Glossop; Peers, John; Lower; Manchester; Reeve, Isaac; Beeston; Slater, William; Nottingham; Spencer; R.C.P., Reford, Notts; Stoke, Tom; Nottingham, Leeds; Tadman, Percy Charlton; Yorkshire; Thompson, Frederick; Sunderland; Westwick, Louis Alfred; Mansfield; Whit; Richard, Carlton, Nottingham.

INSTITUTE OF CERTIFICATED SANITARY INS.—The second annual meeting of this institute was held on the 22nd inst. at "The Museum," Margaret-street, Wm., when the Chairman of the Council, Mr. W. H. May (City of London), in his opening remarks gave an account of the work and progress of the institute during the past year, and stated that

although the expenses had been very considerable, the Institute was financially in a better position than at their last meeting. The number of Honorary Fellows had been increased by the addition of several of the best-known sanitary scientists of the present day, but if ladies could only be persuaded to assist by taking up the practical and teachings of hygienic science—say in the formation of a Sanitary Primrose League—a very great step in the right direction would be made. The President of the Institute, Professor Wynter Blyth (Medical Officer of Health, Marylebone), then read a paper upon "The Education of the Sanitary Inspector—Past, Present, and Future," in the course of the paper, Dr. Blyth said that he considered that there should be an extension of the system of instruction inaugurated by the Institute in the way of technical training for some of the posts connected with the inspection of factories. There were many grades of factory inspectors, and some of these might be filled well by officers in the sanitary service. To facilitate this he desired much to see a course of special instruction initiated with regard to factories and workshops; something of this kind had been commenced in the admirable series of industrial hygiene lectures of last session, but they were too few in number and too restricted. He looked with approval on the appointment of lady sanitary officers; these had been appointed in Brighton, in Kensington, and in Nottingham, and in a few other places. So long as there were millinery establishments needing supervision, factories employing female labour, underground sanitary conveniences for women, and infant crèches, their services could be utilised, but he considered that the training should be equally severe as for male appointments, and that they should pass a qualifying examination. In practical work he drew a distinction between two classes of nuisances; the one technical, not causing injury to health, the other serious. If a single technical nuisance existed in a house, such, for example, as a dustbin wanting a lid, he disapproved of official action, considering that this belonged to "fussy sanitation"; and if every little thing was to be officially controlled, sanitary inspectors would become a greater nuisance than the nuisances they were called upon to abate.

CIVIL AND MECHANICAL ENGINEERS' SOCIETY.—A paper was read before this Society on the 20th inst. by Mr. A. Fairlie Bruce on "Cement and Concrete Testing as carried out for the Glasgow Corporation Waterworks." The author gave details of the method of weighing, mixing, gauging used for ascertaining the degrees of fineness to which the cement was ground, testing machine used, methods adopted for detecting the existence of free lime, and several tables of results. He entered fully into the general question as to the proper proportions for the aggregate and cement, and gave a formula for ascertaining the growth of the strength of cement; this was arrived at only after a long series of experiments. The question of the best sand for mixing with cement was gone into, the author preferring sand derived from crushing Whinstone or Sandstone to either pit or river sand.

# MEETINGS.

FRIDAY, MARCH 30.

Architectural Association.—Discussion on the London Streets and Buildings Bill. 7.30 p.m.

SATURDAY, MARCH 31.

Junior Engineering Society.—Visit to the Tower Bridge; meeting on Middlesex side. The President, Mr. J. Wolfe Barry, Engineer of the Bridge, will show the members over. 3 p.m.

Queen's College, Cork.—Mr. Arthur Hill on "The History of Architecture." XI. 3 p.m.

MONDAY, APRIL 2.

Surveyors' Institution.—Adjourned Discussion on the paper read by Mr. Howard Martin, at the last meeting, on "The Report of the Local Government and Taxation Committee of the London County Council on the Subject of the Rating of Ground Values." 8 p.m.

Society of Engineers.—Mr. E. Lloyd Pease on "Gas-holder Construction." 7.30 p.m.

Society of Arts (Cantor Lectures).—Captain W. De W. Abney on "Photometry." I. 8 p.m.

Junior Engineering Society.—Mr. F. R. Taylor on "The Industries of Devon and Cornwall." 8 p.m.

Sanitary Institute (Lectures and Demonstrations for Sanitary Officers).—Dr. Louis Parkes on "Sanitary Laws and Regulations Governing the Metropolis." 8 p.m.

Victoria Institute.—Paper on "Babylonian Exploration." 4.30 p.m.

Leeds and Yorkshire Architectural Society.—(1) Nomination of Officers; (2) Smoking Concert. 7.30 p.m.

TUESDAY, APRIL 3.

Institution of Civil Engineers.—Mr. Charles Hunt on "The Construction of Gas-works." 8 p.m.

Gas Institute.—Professor J. A. Fleming, M.A. on "Electric Illumination." I. 8 p.m.

Glasgow Architectural Association.—Mr. Allan Graham on "Byzantine Architecture." 8 p.m.

WEDNESDAY, APRIL 4.

British Archaeological Association.—(1) Dr. Winstone on "Epping Forest in Pre-historic Times." (2) Dr. A. C. Fryer on "American Tumuli." 8 p.m.

Society of Arts.—Mr. C. F. Buns on "The Elements of Beauty in Ceramics." 8 p.m.

Builders' Foremen and Clerks of Works' Institution.—Ordinary Meeting of the Members. 8.30 p.m.

Edinburgh Architectural Association.—(1) Mr. P. Miller, F.S.A. (Scott) on "The First Wall of Edinburgh, or King's Wall, and some evidence relating thereto." (2) Mr. G. S. Aitken, F.S.A. (Scott) on "The Ancient City Walls of Edinburgh and Modern Edinburgh." 8 p.m.

Institution of Civil Engineers of Ireland.—Meeting at 35, Dawson-street, Dublin. 8 p.m.

THURSDAY, APRIL 5.

Royal Institution.—Mr. F. Seymour Haden on "The Etching Revival." I. 3 p.m.

Society of Antiquaries.—8.30 p.m.

Dundee Institute of Architecture, Science, and Art.—Social Gathering in the Victoria Art Galleries, Dundee. 6.45 p.m.

FRIDAY, APRIL 6.

Institution of Civil Engineers (Students' Meeting).—Mr. W. H. Hamer on "The River Hunter." 8 p.m.

SATURDAY, APRIL 7.

Edinburgh Architectural Association.—Visit to the University Hall Buildings, Edinburgh.

Queen's College, Cork.—Mr. Arthur Hill on "The History of Architecture." XII. 3 p.m.

# RECENT PATENTS:

## ABSTRACTS OF SPECIFICATIONS.

2,407.—FIREPLACES: J. Dean.—With the view of obtaining automatic consumption of air, smoke, and gases in fireplaces, the bottom layer of the fire is, according to this invention, supplied with air necessary for combustion from an open ash-pit through a bottom grating, the level of the flue being just above it. This bottom layer being always brightly burning, all smoke and gas is drawn down through it. Where necessary, special flues are made.

5,680.—FLUSH-OUT CISTERN: C. Darrah.—In this apparatus a tube or barrel is fitted with a piston, and communicates with the down-pipe of the cistern by a branch-pipe opening into the tube or barrel at a point near its top end. The piston being light, the rush of water serves to keep it up above the opening of the branch-pipe till the cistern is drained and the syphonic action ended by the bottom end of the tube being uncovered with water.

6,388.—MOSAICS: H. B. Allcock (Montana, U.S.A.).—A plate of glass is placed on the top of the painting or picture to be represented in mosaic, and a transparent coloured sketch or copy of the picture is made on the surface of the glass. The plate is then held in such a position that the copy is plainly visible through the glass. The smooth surface of the blocks of stone or other substance of which the mosaic is to be composed are then cemented to the under surface of the glass. When this has been entirely covered, the under rough surface of the blocks comprising the mosaic are covered with cement, thus forming a solid, firm mosaic. When the cement has hardened sufficiently, the glass plate is removed, and the smooth or upper surface of the mosaic is polished and cleaned.

7,042.—BRICK-MOULDING MACHINES: J. W. Crowen.—To ensure that the mould-table is driven slowly in carrying the filled moulds from under the pug-mill, and then quicker for the rest of the movement, the gear is made elastic, and acts automatically to bring about this result.

7,047.—PARQUETRY: J. Freyberg.—Small slabs of wood are placed on the cross-grain, glued together, and then sawn and cut very thin, and the sections cemented on to a scrim or canvas.

10,619.—PAINT: W. Ward and another.—For painting the inside of petroleum tanks, a special indurabler cement or paint is used, the formula for making which is given in the specification.

24,246.—FLOORS: J. Collingwood.—Two thicknesses of boards are used, the same being screwed together, and having between them galvanised wire netting, the whole forming the improved system of construction.

24,673.—PREVENTING SMOKE, &c.: W. Benning and another.—A false back of fire-clay or metal is arranged toward the back of the fireplace, and the lower edge is arranged to receive a sliding damper to regulate the air-supply.

6,589.—VENTILATORS: D. Donald and another.—According to this invention the main body of the ventilator consists of a series of vertical louvres protected by an outer arrangement of baffle-plates. The wind striking against these baffle-plates and over the louvres exhausts the foul air through the central shaft of the ventilator. The cap is of a conical shape, and is made so that a sloping horizontal passage is left between the cap and the top of the louvres, which forms an additional exhaust.

7,189.—VENTILATORS: J. Shaw.—This ventilator also depends on the novel form of the baffle-plates, and the use of a grid or filter in conjunction with the ventilator.

7,473.—VENTILATING: J. Shaw.—This patent is an application of the principles set out in the foregoing invention, especially with reference to the escape or removal of foul or heated air from rooms or buildings.

7,594.—FIREPROOF FLOORS: R. Astley.—A number of iron joists are, according to this invention, placed about 2 ft. apart, and between them are fixed special fire-clay tiles. These tiles are constructed with a bottom flange grooved to receive the ceiling plaster, and a vertical central web with a roll on the top with a hole through. An iron rod web with a roll on the top with a hole through. An iron rod web with a roll on the top with a hole through. An iron rod web with a roll on the top with a hole through.

16,416.—FIREPROOF CEILINGS: W. A. Byrr.—Mortar tiles with suitable keys on their edges to retain the plaster are laid over the wooden floor joists.











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W. H. Parker ..... 1,029 15 0 I. J. Turner, Wain-  
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WATFORD.—For the erection of a hospital for infectious diseases, for the Watford Union Rural Sanitary Authority, Mr. Chas. P. Ayres, architect, 14, High-street, Watford. Quantities by Mr. J. W. Bailey, Kilburn.—  
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# The Builder.

VOL. LXVI. No. 2670.

APRIL 7, 1894.

## ILLUSTRATIONS.

The Ancient Cathedrals of Ireland: I.—St. Patrick's, Dublin.—Drawn by Mr. Roland W. Paul .....	Double-Page Ink-Photo.
Plan of St. Patrick's Cathedral .....	Double-Page Photo-Litho.
Studies for Restoration, Forum and Basilica, Silchester: First Building.—By Mr. G. E. Fox, F.S.A. ....	Double-Page Ink-Photo.
Studies for Restoration, Forum and Basilica, Silchester: Second Building.—By Mr. G. E. Fox, F. S. A. ....	Double-Page Ink-Photo.

## Blocks in Text.

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### Lead-work.



HE above title does not refer to the making of S bends or of wiped joints, or any other of the operations included under the general head of "plumber's work" as ordinarily understood, but to the now almost extinct practice of the use of this manageable and ductile metal in ornamental work. The architectural world of to-day, or a section of it, is just now awakening the fact that lead has in past time been largely used in an ornamental and decorative fashion, either in works created purely for ornament, such as statues and vases, or in the ornamental treatment of objects of utility made in this material, such as cisterns and rain-spout heads. We published only last week an example of the revival of this use of lead in modern times in the shape of the details of a lead spout-head and conduit designed by Mr. Ferguson for Tullie House. We presume that Mr. Lethaby, whose little book on Lead-work\* suggests these remarks, would scoff at these because drawings were admittedly made for them by an architect (see the final page of his book), instead of their being the spontaneous effort of the leadsmen's fancy. That, *pace* Mr. Lethaby, is a little bit of the æsthetic bigotry of the "craftsman revival." If the workers in lead have for the present lost any use of the possibilities of their material in the way of decorative treatment, it is surely better that they should produce decorative work in it at the suggestion of an architect than that they should not produce such work at all. This sentence is almost the one which we have to find in the book in question which is the reason we begin with it, to get rid of it at once. If the argument applies to lead-work, surely it applies to everything else in the shape of craftsman's work. Then why does Mr. Lethaby himself make excellent designs for chimney-pieces and furniture, for artisans to work from? We might reply say equally of these, that "they have been carefully, painfully 'executed' to

the architect's drawings." Yet they are unquestionably much better to look at than a great deal of furniture which has not been executed to an architect's drawings. If Mr. Lethaby believes so exclusively in the craftsman, why does he not make tables and book-cases and chimney-pieces himself, instead of designing them? Or why scoff at the architect who makes drawings for lead-work, and the docile craftsman who works from them? It would be delightful, of course, if the worker in lead had the wish and the faculty to produce, out of his own pleasure in the work, a beautiful decorative treatment of the material. But since he obviously has not at present, surely the architect may deserve thanks for trying, by his drawings, to invite the workman to something better.

Apart from this little inconsistency, as it appears to us, Mr. Lethaby's small book is an admirable *résumé* of what has been and may be done in the way of artistic lead-work. After a brief historical sketch of the treatment of lead at different periods, the author re-commences on one of the practical uses of lead, as a covering to buildings. Some of his remarks on this portion of the subject we cannot altogether concur in. He observes that the lead roof must have been perseveringly maintained as the covering of the Medieval cathedrals from a preference for its effect above any other kind of roofing. "The creeping of the lead on steep surfaces, the many burnings, and the great expense in large churches which would take literally acres of lead, made maintenance a burden, but they liked this metal casing, and that was enough." It might be suggested perhaps that there is a great element of conservatism in Medieval architecture, in spite of its rather rapid changes in regard to style, and that when once it had been recognised that lead was the proper material for roofs, in a practical sense, it would be regarded as a matter of course to continue its use. But if the continuance were really from a preference of this to any other then available material, it was a justifiable preference. No other mode of covering a timber roof suits so well the long narrow roof of a Medieval church, in which the lines of the rolls break up what would otherwise be a long plane surface, give scale to the building, and carry on the feeling of prevalent verticality of line which belongs to

the style. We somewhat question the fact of a preference for timber and lead-covered spires over stone ones. The weight, in spite of the lead, was much less than that of the stone spire, and could be placed on a central tower with less danger of spreading the arches of the crossing. At all events, if this was a preference, it was a less reasonable one than in the case of the long low roofs of the nave and choir. In these latter cases the roof was hardly a portion of the architectural design in the same sense that the spire was. It was not disguised, but it was a covering merely, while the spire was a prominent architectural object. A stone spire, blended in design with the upper part of the tower, is a far more monumental-looking structure, and becomes a part of the architecture, whereas the lead spire has more the appearance of an addition, an afterthought, unconnected with the main architectural design. It may be questioned whether Lincoln would have gained by the three tall leaded spires said to have once surmounted its towers, more especially considering the lofty site of the cathedral, which is not so æsthetically suitable for spires as a level site. And here again, granting that such a spire was erected on the central tower of Lincoln in the fourteenth century, can we reasonably suppose that this was from a sheer preference for this form of spire? Is not Lincolnshire dotted over with churches with stone spires, some of them (though not the loftiest) earlier than this date, many of them not far from it? In the face of this evidence, we should conclude that the erection of a timber and leaden spire on the central tower of Lincoln, in preference to a stone one, was due to timidity, or at least prudence, on the part of the builders. In Devonshire we find undoubted preference for the leaden spire, though we do not know that Barnstaple church is a very fortunate instance. It illustrates at all events the less monumental character of the leaded spire, in its rather unhappy-looking twist. The shorter and more thickly-proportioned spire of Branton is very picturesque and characteristic, and has maintained its lines better, though one has only to look at it to see how much patching and repairing has been requisite in the course of time. Nor can we quite rise to the author's enthusiasm in regard to the outer cupolas of St.

\*Lead-work, Old and Ornamental, and for the most part English. By W. R. Lethaby, with Illustrations.—London: Macmillan & Co., 1893.



Mark's, which, as he happily observes, is not so much a building with a dome, as a building "bubbling all over with domes;" and great part of the exterior picturesqueness and peculiar character of the building is no doubt due to these. But when we look at the section of St. Mark's our respect for them rather diminishes. They are so obviously unconnected with the really monumental portion of the design, they have so little relation to the interior; they look like huge bonnets arbitrarily fixed on over the genuine domes. Lead covering directly on a stone dome is another matter, though of course the dome in that case must be designed with regard to exterior as well as interior effect, which is not the case with the masonry domes of St. Mark's, nor indeed with St. Sophia, which is a building mainly for internal effect. It looks as if the Venetian architects, in adopting the low segmental Byzantine dome, had felt this deficiency, and proceeded to make an exterior domical scenery over the real domes. They succeeded in their intention, but in a manner which is a little barbaric after all; though this barbaric element is, perhaps, in a way, a part of the charm of St. Mark's, of the hold it has on our imagination.

We cannot quite go with the author in what appears to amount to a recommendation that we should return to the use of cast lead for roofing, in place of milled lead. He does not positively say so, but the effect of his short chapter on the subject is to leave that impression. While we fully agree with him as to the more agreeable appearance of cast lead, his own admission that it is not quite even in thickness and is subject to faults in the casting (to which may be added its greater weight in order to ensure sufficient strength in the thinnest parts) is more than enough, on practical grounds, to overbalance the charge that milled lead is more liable to crack. The preference for cast lead seems to be archaeological rather than practical.

The most interesting part of the book, and the larger proportion of it, is that which describes the decorative uses to which lead-work has been put. These form a very good summary, accompanied by a good many illustrations of decorative work of various types. We have records and illustrations of lead coffins, relief sculptural subjects on lead fonts, inscriptions, tankards, statues, and vases. The attempt to revive the liking for statues in lead we hardly think can be successful. It is true that, as Mr. Blomfield observed in his book on gardens, the material is one which improves in tone of surface by weathering, and in this climate is better fitted for out-door statues than stone in that respect; but there is a certain clumsiness of appearance in large-scale figures modelled in lead which cannot be got over, and which is in fact very faithfully represented in Mr. Lethaby's sketches of some of these works, which have a rather unhappy look. It is true that the author seems half inclined to regard lead as a material in which you may execute figures which it would not be worth while to execute in more monumental materials. "It is a material on which a designer may permit himself slightness, caprice, or even triteness. A statue that would be tame in stone, or contemptible in marble, may well be a charming decoration if only in lead." But is this saying very much for the material?

It is better suited to vases and their enrichments, and we quite agree with the author in his admiration of the charming example from Hampton Court, with its little seated figures rising from the handles. For finials and crestings lead is of course admirably adapted; and the cistern and pipe-head decorations given represent exactly the best treatment of the material, and are excellent suggestions as to style, if used as such and not merely as things to copy from. The best of all is the one from Haddon (Fig. 70) an admirable design in which a rich cresting forms the finish to the plain surface of the head, which is ornamented only by a circular patera in low

relief on the middle of the space. In spite of the ductility of the material (should we rather say because of it?) low relief ornament seems best suited to lead, as the softness of the material gives an appearance of fragility to ornament in high relief, except in regard to the rounded bossy masses of figures in relief.

As to various possible uses of lead in decoration, we notice the author's suggestion that it might effectively be used as an inlay in cast iron, where the work has not to be painted; the grey, subdued lustre of the lead would have a very good effect in this manner. The possibilities of the material for pattern glazing, where white glass only is employed, and the lead lines become the prominent object, are well touched upon and illustrated. Where coloured glass is the main object of the design, we hold that the lead is entirely subordinate as to its lines of design; only it should be constructively recognised, not shirked.

The book is well worth the attention of all architects, who may derive useful suggestions from it, even if they do not accept the author's views entirely.

#### STUDIES FOR THE RESTORATION OF THE BASILICA AND FORUM OF THE ROMAN CITY AT SILCHESTER.

By MR. G. E. FOX, F.S.A.

THE *basilica* and *forum* of the Roman city at Silchester, which were excavated by the Rev. J. Gerald Joyce, late Rector of Strathfieldsaye, between the years 1867 and 1873, have recently been carefully re-examined and planned under the auspices of the Society of Antiquaries.

From the discoveries made in the re-examination and from the architectural fragments, now for the first time collected, from which drawings to scale have been made, it has become possible to attempt a restoration of this group of buildings, which constituted the centre of the Roman town. These restorations form the subject of illustrations in the present number.

The courtyard, or open area of the *forum*, measures about 142 ft. from north to south by 130 ft. from east to west. It was lined by ambulatories on three sides, the roofs of which were upheld by ranges of Doric columns, which must, from existing remains, have been between 15 and 16 ft. high. Behind the ambulatory lay ranges of chambers, offices on the south side connected with the Government of the city, shops on the east and north sides. External to all these there was another ambulatory which surrounded both *forum* and *basilica*. The internal ambulatory probably had a terraced roof, in order to allow of windows above it of sufficient size to light the various chambers and public offices of the south side. The shops on the north and east sides may have opened on both ambulatories, the inner and the outer, and in this manner have obtained a sufficiency of light. As the walls are everywhere of considerable thickness it may be presumed that these shops had rooms over them for storage or habitation, access to which was obtained by wooden stairs from below. The three ranges of building of the *forum* were in all likelihood covered by a roof whose height was the same as that of the aisle roof of the adjoining *basilica*. It was covered by hexagonal stone slabs. A gateway of some stateliness, but whose form it is not easy to determine, gave access to the *forum* and its area on the east side, while two others of less importance served as entrances on the north and south. The north side had, at a point about the centre of its length, an apsidal chamber opening upon the inner ambulatory—probably an *exedra*.

The *basilica* lay west of the *forum*, its eastern wall forming the south side of the *forum* and bounding its area on the west. It was a long rectangular hall lying north and south, 58 ft. in width and close upon 270 ft.

in length. It had an apse at each end, and an apse of larger dimensions, or rather an apsidal chamber, opened upon the centre of the building. The central apse had been decorated with various marbles, and from its size and position was probably the council hall of the governing body of the city. It evidently opened in its full width upon the body of the *basilica*, and access was obtained to it by three wide steps. The floors of all these apses were raised over two feet above that of the *basilica*. To north and south of the central apse, and lining the west side of the great hall, were various chambers, all of which had the same breadth east and west, though in other directions their dimensions varied. What purposes they served can now be only a matter of conjecture. In the most southern Mr. Joyce discovered, buried in the *débris*, an eagle of bronze, which he believed to be, and probably with truth, a legionary one.

The *basilica* had a varied history, which may be read plainly enough in its ruins, although, as in the constructions of the adjoining *forum*, the masonry seldom rises above the level of the floors.

Originally this great hall, 58 ft. wide and 270 ft. long, was divided into a central nave, with aisles on each side formed by colonnades, fragments of the columns of which colonnades still exist. As the central apse opened into the *basilica*, and could only be lighted from it on account of the chambers of the western side, there may have been a transept, formed by the interruption of the colonnades at this point.

From its great length in proportion to its breadth, and from the disposition of its apses, it is impossible to suppose that the building was used for one purpose only. If it be taken for granted that the north and south apses, with their raised floors, indicated the positions of the law courts, and that screens parted these courts off from the rest of the building, it will be seen that a space will be left in front of the great central apse which might very well have been set apart for the use of the citizens on important occasions—such, for instance, as the election of the magistrates of the city.

For a considerable period from its foundation the *basilica* and its annexes doubtless remained the chief ornament of the city. But an evil day came at last. Either in some internal tumult, or by the incursion of external enemies, the town suffered severely, and the *basilica* was burnt down (See "Archæologia," xlvii., 359, *et seq.*). After a time, when peace had been restored the inhabitants began to raise again the fallen buildings. Those on the west side of the *basilica* were erected with the same plan and on the same foundations as the old ones. The existing remains show clearly enough, what was also proved by excavation that in this part no change was made in the disposition of these various chambers. It was otherwise with the great hall. There all was altered. The colonnades were not rebuilt, their sleeper walls even seem to have been rooted up, and the cleared space re-divided into a wide nave with an eastern aisle, a new foundation being laid for the support of the colonnade or arcade upon it. Neither of the semi-circular apses, north and south, were rebuilt, but rectangular chambers of smaller dimensions took their place, forming in a lop-sided way the new tribunals of the courts. A reference to the plan of the altered building will show the awkward manner in which this alteration was effected, and which is plainly to be seen in the existing remains of the northern tribune. If the re-erection of the *basilica* and its dependent chambers took place at a late period of the Roman rule in Britain it is possible that the arches of Diocletian may have been substituted for the entablatures of the age of the Antonines, the probable date of the earlier edifice. This conjecture is rendered plausible by the fact that no fragments of entablatures have been found. Certainly in the later structure the materials



the earlier were used again as far as they are available, for such fragments of the pitals of the columns as have been reserved, show a superiority of workmanship far beyond what could have been attained in the time of Constantine or at any other date. It would seem that additional pitals were required for the later work, a sufficient number not having been saved from the ruin of the earlier colonnades. Imitations of these were made to supply the deficiency, and a large fragment of one of these last has been found.

It has been supposed that the *basilica* had galleries, but there are no traces of staircases, and such galleries would have required several. It may, therefore, fairly be assumed that the building was without these adjuncts. Within the limits of the space permitted it is not possible to enter into a description of either the fragments of the structures or the plans of the buildings fully described, on which the studies for restoration are based. The fragments themselves are deposited in the museum at Reading, the nearest large town to the site of Silchester, and form a considerable part of the growing collection there, and the plans may be seen in the various reports published by the Society of Antiquaries upon the excavations conducted on the site of the Roman city.

In the room devoted to the architectural remains from Silchester in the museum at Reading, perhaps for the first time the architecture of the Romano-British period has been exhibited in a way that is justly its due. In most instances the want of special knowledge on the part of curators of county museums has caused the relics of the Roman buildings entrusted to their care to be relegated to any obscure corner of the collections under their charge, or has precluded the admission of such relics altogether. Their usual fate has been either to be broken up for road or building material, or by exceptional good fortune to be neglected on the spot where they were found, or to form the ornament of a rockery in some garden, as is the case at this moment with one of the finest Roman pitals in this country.

Not only are these remains cared for at Reading, but the site from which they come is being systematically explored. The work is already progressed so far that it is now possible to understand the character of one of the towns of Roman Britain, with its houses, its temples, its baths, its municipal buildings, and from the discovery made in 1912, it may be added, its churches. Out of 150 hundred acres constituting the site but only half have as yet been explored, and so few have yielded such an abundant harvest of knowledge, how much more may be expected from those which remain unexamined.

Two methods of investigation with respect to the Romano-British period are open to us, pursuing either of which we may obtain the insight into the state of civilisation in that period. One is by the study of inscriptions, which are by no means plentiful in Britain, the other by such excavations as are being carried on year by year at Silchester. There is no fear of a paucity of workers in the former field, but few are becoming in the latter, although this latter would yield results as important as any hitherto obtained by any other method of research.

#### NOTES.

THE Government have lost no time in bringing forward their Bill "for making better provision for the settlement of labour disputes." The measure is, of course, under the charge of Mr. Mundella, Mr. Asquith and Mr. Burt being also associated with it; and, whilst it is an advance upon previous legislative proposals, it is still purely dilatory. The new feature is that the Board of Trade are empowered to take the

initiative in endeavouring to bring the parties to a dispute together, without waiting for any appeal or invitation,—and this, not only when affairs have got to a deadlock, but wherever a difference exists "or is apprehended" between employers and employed, or between different classes of workmen. The Bill aims at following up such intervention of the Board of Trade by the establishment of district conciliation boards and courts of arbitration. It is proposed that a list of experts and others willing to act as arbitrators shall be kept by the Board, so that whatever particular industry may be concerned, a suitable umpire can be selected. This would seem to be the State adoption of the plan initiated by the London Chamber of Commerce, which, by-the-by, has apparently been also copied by the Melbourne Chamber of Commerce in their Voluntary Tribunal of Arbitration. The new Bill stops short of making the decisions of the arbitrators compulsorily binding—an omission the wisdom of which has been questioned. The President of the Board of Trade, in introducing the measure last week, alluded to the great service already rendered by Mr. David Dale and Dr. Spence Watson as arbitrators, and mentioned that the latter gentleman has just issued his fiftieth award, and that never in a single instance had any award of his been disputed. It might be argued from this record that the arbitrator's decisions would seldom give such dissatisfaction as to require legal enforcement; but, on the other hand, there will always remain the possibility of awards being disputed, and it is certain that very elaborate provision would have to be made to maintain the dignity of the law in the event of a decision under the Act being resisted.

THERE are some additions to the recently-issued Education Code, 1894, which show that the Education Department is rightly determined to continue in the policy on which it has entered, namely, of bringing up the elementary schools of the country to a proper sanitary standard. It is the idlest nonsense for those in authority over these schools to complain that the Education Department now insists on things which hitherto it has not required. A Government Department lives and learns, and it is none too soon that the Education Department has arrived at the conclusion that sanitary requirements must be strenuously insisted on. Thus, the managers of a school are now not only to close their school at the direction of the sanitary authority of the locality, in case of such a matter as an epidemic, but when "any danger to health is likely to arise from the condition of the school." Again, every part and corner of a school is now to be fully lighted, an important point, since there is no doubt that the eyesight of the rising generation depends largely on the way in which it is cared for in childhood and youth. Further, cesspools, when necessary, are to be constructed at least 20 ft. from the school. These things, though comparatively matters of detail, all show that those who manage the elementary schools of the country must make up their minds that, year by year, fresh demands will be made on them, in order that the buildings under their charge may be kept up to the moving standard of the times. Some persons may sneer at such requirements as "fads," but nearly every improvement of a sanitary character is called by a large number of persons a "fad." We can only regret that every school in the country, whether elementary or of a higher grade, is not compulsorily kept up to a proper sanitary standard. There is one point in this connexion on which emphasis must be laid. It is high time that, as regards structure and sanitary arrangements, the elementary schools were under the charge of technically qualified inspectors. The inspectors who visit a school in order to test the mental knowledge of the pupils, should not have to examine the closets and the character and manner of the ventilation of the build-

ings. This should be done at another time by another inspector, who has received a professional training. It must come to this sooner or later, and the sooner the better.

THE Building Exhibition has been a fair success; certainly, as we have already observed, a great improvement on its immediate predecessors. But it has not been what we should have expected after all the promises made about it. One or two cautions we are disposed to offer for the future. It was said in the prospectus that this was to be the first of a series of five similar exhibitions under the same management, but we do not recollect that anything was said as to the intervals of time at which they were to be held. If there was any idea of holding them in five consecutive years, we must say that we should regard such a scheme as being disastrous to any prospect of their real success. For an adequate building exhibition (which this one was not), one which should represent fully the means, methods, and materials of building brought up to their latest date, once in five years is often enough. It is not like successive exhibitions of artistic designs, where we may find something new every year. Progress in construction and the application of material does not move fast enough to present very important changes year by year. An annual building exhibition can only result in a repetition to a great extent of the same things, and must tend to become a mere advertisement or bazaar for manufacturing firms to display their wares; even those firms which are not under general necessity to advertise themselves feeling often obliged to put in an appearance in the usual way, lest they should be supposed to be dropping out of the race. There is nothing gained by this; to be worth holding at all, a building exhibition should be an opportunity for studying the last new methods and materials, and such cannot be produced in sufficient quantity annually. Then, again, a really complete and typical building exhibition, on such lines, ought to be open longer than this one has been, especially when one considers that a week was to a great extent lost to visitors by the late appearance of the catalogue—one reason why some things were missed out in our notes which would otherwise have been mentioned. We do not say the time was too short for the exhibition as it was, but it would have been too short for the exhibition as it ought to have been, except for those who have a great deal of time on their hands. A minor point in which reform is called for is in regard to the constant touting of attendants and thrusting of prospectuses upon everyone who was seen paying any special attention to the exhibits. Visibly to make a written memorandum was to draw upon the writer the pressing attention of every custodian of a stall within sight, eager to thrust upon him a bundle of printed descriptions of their wares, till the thing became a perfect nuisance. This ought in future cases to be strictly forbidden, and the agents or attendants at stalls given to understand that their business is to give information only when asked for, and not to thrust their attentions on visitors as if they were anxious to drive a bargain there and then.

THE fact that on Saturday last a deputation of carpenters and joiners applied to the Metropolitan Asylums Board, asking that no limit should be fixed to the hours of work, as during the winter the working hours were so short that they wished to make up for them in the summer, is a significant comment on the attempts which are being made by the Trades Union leaders to bring about a legal restriction of the hours of labour. It shows that some of the artisans are beginning to appreciate what may be the practical result of such legislation on their own pockets. In regard to the forty-eight hours question generally, the correspondence which has been continued in



the *Times* on the subject of Messrs. Mather & Platt's communication, before referred to, shows that others, like ourselves, do not regard their experiment as at all conclusive. Mr. Henry Gourlay observes that the leaders of the new Trades Unionism desire to shorten hours, not in the belief that the same men will turn out the same work in the shorter hours, "but in order that more men may be employed to turn out the same work"; and he makes the commentary, "all intelligent persons must see that if a greater number of persons are employed to do the same work there will be less surplus to divide between employer and workmen." Messrs. Mather & Platt consider that it is for the advantage of the men to work harder in shorter hours, and turn out the same amount of work in the shorter time, and the men have so far supported them. But that result is not by any means what the agitators for the eight hours movement want.

THE accident in Regent-street last week, when some painters fell from the outside of a building into the street below, necessarily directs attention to the very haphazard way in which this class of workmen frequently are exposed to danger. It was but in the course of last autumn that a workman employed on the outside of the Law Courts was killed through the insecure manner in which a rope, by which his seat had been hoisted to a great height, had been fastened. The practical question appears to be whether for painters' work outside high buildings there should not be some generally accepted form of suspended platform, supported by chains or ropes which have been tested to bear a particular weight, and whether a builder or master painter who may employ any other sort should not be exposed to the risk of a fine. Painting the outside of a house, suspended in the air, far above the ground, is certainly a dangerous employment. The principle of interference by the State in order to safeguard those who are employed in dangerous trades has long ago been established. No doubt it is undesirable for the principle to be carried further than is absolutely necessary, but it is clear that something should be done in regard to this particular point. As those who are passing along a street are also exposed to risk by the falling of workmen and their platform, the local authority would be justified in making some by-law to meet the danger.

THE exhibition of Mrs. Allingham's water-colour drawings at the Fine Art Society's rooms shows the work of this excellent artist as, if possible, better than ever. The combination of a broad and true water-colour style with the closest attention to detail cannot be better illustrated than in these drawings. There is no mere copying of Nature's detail, but there is the most faithful representation of its effect by a method of execution which it is difficult to analyse on close inspection, but which produces, as by a kind of instinct, the effect required. The figures, though generally subordinate, are always thoroughly studied, and even on the smallest scale seem to have character and individuality. In the beautiful drawing "Near Whittington" (18) the figures have a most marked influence on the effect of the whole; and we would draw special attention to those in "A Cottage Gate" (22), where the figure of the grown-up girl, leaning in an attitude of almost classic grace against the side of the gate, is so admirably contrasted with the timid, careful steps of the small child for whom she has opened it. Among other drawings may be specially mentioned "Cottage at Freshwater" (14), "Old Kentish Manor House" (17), "At Pinner" (37), "Valewood Farm" (41), "Whittington" (65), and "Hedge's Farm, Pinner" (68).

THOSE who are interested in decorative designs for wall covering should look at the collection of new designs at the warehouse of Messrs. Jeffrey & Co. in Essex-road. There are some noteworthy designs by Mr. Stephen Webb, Mr. Sumner Heywood, Mr. Walter Crane, and other well-known decorative artists, and also one or two new effects in the use of material. One of these is a paper with a comparatively smooth wool flock ground, with an apparently raised pattern in silk flock—really of course applied or dusted on. There are one or two papers of this type in a warm amber tone which have a charming effect, especially from the changing sheen on them in different lights. Another paper of this type is a very delicate and graceful design by Mr. S. Webb, of a symmetrical and rather Renaissance character, consisting of a thin, light-toned, conventional scroll-work on a green ground, designed to go with a figure frieze by the same artist. Mr. Heywood Sumner's "vine" pattern, which was in the last Arts and Crafts Exhibition, is one of the new papers offered; as we observed in reviewing the Arts and Crafts Exhibition, it is rather too vertical-looking in its lines, but we find the design is made so that one or more deductions in height can be made out of it, according to the height of the wall on which it is to be used, retaining the same upper and lower terminations; this is a convenience in adapting such a paper for staircase positions, for which, perhaps it is best fitted. Messrs. Jeffrey have also been using for friezes thin copper with a pattern in relief formed by pressure between a mould in relief and a matrix; for the preparation of the mould the metal design is made by genuine *repoussé* process in the first instance, and hence the final stamped copper has a good deal of the effect of genuine *repoussé*—the freedom and absence of mechanical appearance; while it can be produced at a very moderate cost. Among other designs is a graceful and fanciful tulip frieze by Mr. Heywood Sumner, which however would be better if the ground were kept in one colour instead of being shaded off so as to give a partial effect of aerial background, which is out of keeping in a wall paper. We hear that the taste for naturalistic flower papers is reviving again, though not, it is to be hoped, in so rampant form as it once showed; but Messrs. Jeffrey have papers designed to satisfy this demand, which are kept as inoffensive as papers in such taste can be, perhaps, but are not persuasive to the eye of the critic. However, any one visiting the warehouse will find a sufficient number of well-designed "conventionalities" to enable him to support the depressing effect of the realistic papers.

THE longer one lives the more one becomes convinced of the rarity among mankind of that quality which is expressed by the word "business-like," the essence of which consists in doing things at the proper time and in the proper manner, and not at haphazard; and our experience in taking charge of architects' drawings for the Royal Academy goes to show that the architectural profession are by no means more advanced than the rest of the world in this respect. Every year we have endeavoured to make it plain that we are willing to deliver at the Royal Academy all drawings which may be consigned to us in time to be photographed before being sent in, but that with that object they must be sent not later than a fixed hour, and that they must be labelled and accompanied by a letter to the Secretary, in accordance with Academy regulations. Not half of those who have sent us drawings have taken the trouble to conform to these simple conditions. Drawings were sent too late to be photographed, or had not the requisite labels, or were not accompanied by the requisite signed letter, or neither condition was observed, and for a week we have been

put to perpetual writing and telegraphing to architects to induce them to fulfil conditions which had been duly notified to them in our columns, and without which their drawings would not have been accepted at the Academy door. One gentleman sent us a drawing with the cool request, "Kindly do all that is necessary in the way of labels and letter," which we had distinctly notified that we could not do, the writer not seeming to reflect that if fifty people said the same thing we should have to engage special hands to do the work. Others, and among them those who have frequently exhibited at the Academy, sent up drawings in frames which are against the Academy regulations, which they ought to know perfectly well, or could obtain by the expenditure of a penny postage stamp in applying to the right person, viz. the Secretary of the Royal Academy. But the climax was reached by the gentleman who sent three drawings in to us without labels, titles, architect's name, or anything whatever to identify them; and then they would be 'at this minute if he had not bethought himself to come in and inquire after them at the last moment. All the trouble, and possible disappointment to the authors of it, arises merely from people not being business-like in their way of doing things. We have had the same trouble from the same cause every year to some extent, but it has been worse than usual this year, which is our reason for calling attention to it in the hope that it may be ameliorated on future occasions.

#### LETTER FROM PARIS.

AN exhibition of the works of the late P. Galland has been opened at the Palais de l'Industrie, where it occupies a large room in the Musée des Arts Décoratifs. This exhibition constitutes a considerable event in the artistic world. It enables one to appreciate, in collective form, the life's labour of an artist little recognised, who has been at once painter, sculptor, and architect, and whose remarkable and varied talent places him in the first rank of contemporary artists. With a respect for his work which is now unfortunately but too uncommon, Galland has made a kind of conscience of hiding from the public his incessant study and unceasing attempts at the perfecting of his work. For ever important work—and their number has been great—he accumulated a number of studies from nature and left nothing to chance or improvisation. Hence these innumerable drawings, studies of colour, sketches, models in wax and terra cotta of infinite variety, formerly lost or forgotten in his large studio in Rue Fontaine, but which have now been collected at the Palais des Champs-Élysées in honour of the venerable artist.

Galland was not only an artist of the first order in decorative work properly so called, but made a great success also in *genre* and historical painting. Along with cartoons for Gobelin tapestries, floral borders and ornaments, decorated panels in the best style of the Renaissance, he is surprised to find in this exhibition pictures which recall the style of work of the Flemish painters. Among these may be especially mentioned "Marchand de Poissons à Londres," "Le Jour des Cuivres," "La Sortie du Bain," "La Toilette du Baby," "La Servante Anglaise," "La Femme au Miroir," &c. Still more surprising is it to find, not far from these landscapes of fresh and harmonious colour and effect, such as the "Vue des Bords de la Tamise," and scenes in Savoy, in Spain, and Fontainebleau.

Space would not permit of passing in review all the contents of this curious collection of pictures, sketches, sculpture, and decorative compositions which have served as studies for the numerous works of this class executed by Galland in the capitals both of the old and new world. Among these latter may be remarked especially the studies for the large compositions after the school of Veronese which he painted for the Vanderbilt mansion. Everywhere among these works we find the qualities, so rare in the present day, which distinguished the decorative painters of the Renaissance school of the eighteenth century. His aim was to preserve the tradition of Primaticcio, Lepautre, and Audran. Like them he knew how to subordinate his talent to the requirements of architecture. Thus this posthumous exhibition is not only a work of filial piety



it is a splendid example of incessant labour, which is full of instruction for the decorative artist, whose art, it must be confessed, is in no very flourishing condition at the present moment.

The French pastellists have opened their tenth exhibition, which is very interesting, and includes 18 works. M. Lhermitte, the eloquent painter of rustic life, has contributed a series of outdoor studies in Brittany. M. Roll exhibits a fine nude study, as well as a portrait. M. René Ménard gives figures and landscape in one harmonious composition. We may mention also the landscapes of M. Billotte, Montanard, Edmond Bon, and Pierre Lagarde; the animal subjects by L. Gaston Guignard; the portraits of MM. Panniot, Gilbert, and Eliot; the child subjects by M. Gervex; and the flower pieces of MM. Juez and Hellen. One is sorry, however, to find this year the names of Puvion de Chavannes, Bazin, Bessard, and Dagnan-Bouvet.

These really artistic exhibitions give some scope to the eye and mind after the eccentricities of the Impressionists and the school of Symbolism which succeed each other at the Grand Rue Gallery. The other day it was Pissarro, one of the oldest (so to speak) of the school, and who is at all events a brilliant colourist. To-day it is M. Odilon Redon, a mystic dreamer, whose incomprehensible lucubrations seem as if inspired by Hoffmann or Edgar Poe. He shows us nothing but spectres, phantasms, apparitions, monstrous trees and impossible gelaion of all kinds, along with fantastic animals out of dreamland; the whole executed in the strangest colouring, though with unquestionable talent of a kind.

There is to be noticed also the small exhibition organised in connexion with the "Concours Hippique" at the Palais de l'Industrie, and which is confined to pictures in which the horse is the principal subject. We may single out among these the "Aide-de-Camp du 1<sup>er</sup> Empire," by M. Schommer; the equestrian trait of Mlle. Gérôme, by M. Aimé Morot; "Le cheval" by M. Debat-Ponsan, the pictures of Vuillefroy and M. Georges Besson, and some amusing fancies by M. Caran d'Aché. On the other hand nothing in the way of equine anatomy is worse than that of M. Pierre Gavarni, who made the mistake of fancying that he has a special gift for "sporting" pictures.

The small exhibitions which precede the Salons have hitherto kept to the right bank of the Seine. The left bank has now also determined to have its own exhibition, which has been opened in the Bonaparte, under the name of "Salon des Artistes." This exhibition is a success, and really rather a visit. We find landscapes by M. Veller and M. Osbert, pastels by M. Bouter, excellent advertisement paintings by M. Jost, dry-points by M. Félicien Rops and Desboutin, sketches by MM. Willette and Gavarni, and some good works in sculpture by young artists.

In connexion with the Champ de Mars Salon jury of paintings is presided over by M. Puvion de Chavannes, with M. Jean Béraud as vice-president. The number of works sent in this year has been 2,500. At the Old Salon the jury painting has already completed its work, but sculptors, who were to have deposited their works on the 5th, have obtained an extension of time till the 22nd, in consequence of the extremely encumbered state of the central hall.

A view of the limited resources for providing a place for the national museums, there is again of instituting payment for entry to the Louvre. A question recently raised a vehement discussion in the Parisian Press; and the measure, though supported by certain journals as the best under the circumstances, is generally regarded as impracticable, vexatious, and likely to produce very little result. The partisans of the measure assert that since people pay at the national Salons to see works which are often of very moderate interest, they ought not to be paying as much to see the works of the masters. The example of certain foreign museums is also cited. As to this last argument, it is replied that in these foreign museums there are only certain charges made on certain days, and that the National Gallery in particular is four days out of six. It is pretty certain, that in Paris the paying system would raise a great outcry, and the return to gratuitous admission would be almost a foregone conclusion. It is argued also that a better way to increase the income of the national museums would be to devote to them the receipts obtained for permission to engrave at the Louvre and to take casts at the Louvre, and to form the foundation of a fund out of the sale of the crown diamonds,

which has been pretty nearly decided. Lastly, it is proposed to empower the management of the museums to receive not only gifts of pictures but legacies of money from those who may be disposed to leave them. In this manner it would be possible soon to increase the resources of the museums, without depriving the general public of the free study of works of art which they have hitherto enjoyed.

The Louvre has just received a fine piece of sculpture discovered at Chaumont by M. Courajod, and which comes from the tomb of Claude Lorraine, executed in 1551, at Joinville by Domenico de Barbieri and Jean Picard. This was destroyed during the first Revolution. Thanks to M. Lucien Magne, the same museum has also received two capitals and a base of marble, of the fifth century A.D. Another recent acquisition is a sculptured marble medallion—portrait of Giovanni Bentivoglio of Bologna.

There is more and more talk about the future metropolitan railway, which has a strong and determined supporter in the new Minister of Public Works; while M. Picard, the Commissionsaire-Général for the 1900 exhibition, considers the scheme quite indispensable to the success of the exhibition. We have already indicated the line to be taken, as adopted by the Municipal Council, and which includes, independently of the special line from Vincennes to the Bois de Boulogne, the penetration of the great railway lines into Paris, and the junction of the two banks by a viaduct across the Seine. The State authorities appear now resolved to solve the problem as speedily as possible; and it is to be hoped that the Municipal Council will not throw difficulties in the way under the pretext that its recommendations are not adopted in their entirety. Unfortunately the State and the Municipality are not on very good terms at present, for the Colonial Minister has taken possession of the Pavillon de Flore, and the Préfet of the Seine, who by his legal position is the central authority of Paris, has taken up his quarters at the Hôtel de Ville in spite of the opposition of the Council, which has been obliged to give way, and has revenged itself on the Préfet by laying claim to the pictures, statues, and tapestries which adorn his apartments, and which are now to be returned to the museum of artistic collections. Among these is the admirable portrait of Mme. Récamier by Baron Gerard, that of Talleyrand by Prudhon, the "Sappho et Anacréon" of M. Guillaume, the "Néeride" of Moreau Vauthier, &c. These squabbles are all the more contemptible from the fact that the Council itself, when in 1872 it adopted the programme for the competition for rebuilding the Hôtel de Ville, made it an obligatory condition that the architect was to provide apartments for the Préfet in his plan, which MM. Ballu and Deperthes actually did provide, in the mezzanine of the Municipal Palace, in the portion which faces the river, below the Salons à Arcades.

Whatever may be the result as to the Metropolitan Railway, the preparations for the 1900 exhibition will be taken in hand at once without waiting for the railway question to be settled. Thus the national manufacture at Beauvais has already commenced the tapestries which it will send to the exhibition. The work includes four large panels designed by M. Zuber, symbolising the "Four Seasons," and consisting of views in the garden of the Luxembourg, taken at different times of the year. A set of drawing-room furniture designed by M. Monginot, the painter, is also in progress, an overmantel painted by M. Gérôme and garlanded with flowers by M. Lesbron, and various articles of furniture in the style of Louis Seize, designed by M. Chabal, the oldest artist of the establishment.

At the École des Beaux-Arts the first competition for the Prix de Rome in painting has just been decided; the subject was "The Adoration of Shepherds." Twenty competitors, out of one hundred and fifty, have been admitted for the second competition.

We regret to have to record the disappearance of a Paris fountain which has fallen under the pickaxe of the improver. It was not, it is true, of very monumental character, nor of any great architectural attraction. It was a simple stele, rather high, adorned with an eagle crowned with laurel; a bronze mask of a human face spouted the water into a square cistern; it stood, surrounded with foliage, in the middle of a square formed between the streets named respectively Poliveau, Fossés St. Marcel, Fer à Moulin, and Geoffroy St. Hilaire. But it no less formed a part of the history of old Paris, and recalled the works carried out by Napoléon for the embellishment of the capital and the supply of drinking

water. As a historic document, therefore, it might have found favour in the eyes of the Department of Ponts et Chaussées, which does not take much account, however, of archaeological interests, and is too ready to sacrifice art and history to the requirements of the "ligne droite."

## THE ARCHITECTURAL ASSOCIATION: LONDON STREETS AND BUILDINGS BILL.

A MEETING of this Association was held on the 30th ult., at 9, Conduit-street, Regent-street.—Mr. A. W. Earle presiding in the absence of Mr. Mountford, the President—for consider the London Streets and Buildings Bill. The attendance was exceedingly small, only twenty-five members—a bare quorum—being present.

Mr. F. T. W. Goldsmith, hon. secretary, introduced the subject by reading the following notes on the Bill and the petition of the Association against it:—

These few notes, hastily put together at the suggestion of the President, are limited, principally, to the various amendments and additions to the Bill which appeared in the report to the General Committee to the London County Council, and, subsequently, in the petition of the Association against the Bill now before Parliament. When I explain that these notes were written during the Easter holidays, and at very short notice, I feel sure I shall have an audience that will be kindly disposed towards the defects discernible throughout these notes. They are to be taken as illustrative of the work done by the special sub-committee appointed to consider and report on this measure, and it is hoped that they may be the prelude to a full discussion this evening.

The London County Council courteously forwarded copies of the Bill to the Association, with a request that we should consider and report to them upon it, not with regard to the *principles* of the Bill—they were not to be questioned—but with reference to amendments and additions to the text. That is the first occasion, I believe, that the Architectural Association has been honoured by such a request from any public body of the importance of the London County Council, and amongst events of the session 1893-4, may be included this, that at last the Association has been deemed of sufficient importance to give an official opinion on a Bill affecting so largely the comfort and beauty of the metropolis as the "London Streets and Buildings Bill, 1894."

It is to be regretted that the time at the disposal of the sub-committee was so short, although the Council, at our request, kindly extended the date for receiving the report—since, as was represented, the time available precluded the possibility of considering all sections of the Bill in detail.

What the sub-committee did was to consider such parts of the Bill as are distinctly structural and involving very serious amendments and alterations to property within its sphere. Of course, other points were discussed and dealt with, but to lack of time must be attributed the absence from the report of such artistic suggestions as were referred to by Dr. Longstaff in his speech at the Royal Institute of British Architects, and Mr. Statham at the adjourned meeting on March 19. I venture to hope that these art suggestions may be forthcoming this evening, as supplemental to what the Architectural Association has already done.

Dr. Longstaff's speech contained a lament of the apathy and indifference of architects, as artists, to the efforts of the Council to increase the beauty and picturesqueness of London's streets. The Council, he said, had tried to control and limit the horrors of street-advertising, yet, he complained, no help or advice was forthcoming from the Art Committee of the Royal Institute! Let us try by the discussion to-night to show the Council and the public that, although desirous of preserving reasonable and just rights of property, we are mindful—and fully mindful—also, of the larger, though less generally acknowledged, rights of an art-loving public to beautiful buildings, harmoniously grouped together, in streets and squares where their beauty may be seen and their proportions appreciated. As Mr. H. H. Statham very aptly put it, "it is not only 'property, property,' with its rights, that has to be considered; we should not give colour to the idea that we act merely as a Property Defence League. In this connexion I may mention that the Architectural Association is, I believe, the only Society that has petitioned against the carrying up of the party wall above the roofs of buildings of the dwelling-house class. Mr. Caroe's letter in "A. A. Notes" this month



will have brought this before the notice of members, and the views expressed in his letter have been duly set forth in our petition against the Bill.

The general grounds of opposition to the Bill as stated in the petition, are that it "contains clauses which, in the opinion of this Association, would be impracticable and inoperative, and, in many instances, the operation of the Bill would involve great loss to owners in the metropolis, without any compensation to them, or resultant benefit to the community in general." They further submit "that the provisions of the Bill injuriously affect the recognised rights, interests, and privileges of the petitioners, and are, in many respects, such as should not receive the sanction of your honourable House."

The petition then enumerates the main defects of the Bill, as already reported to the London County Council; and these I propose to give—omitting only some minor amendments to the text—in the order found in the report and petition, adding, if you will allow me, a few remarks of my own on the suggested alterations. Amongst numerous undesirable references to be found in the Bill are the frequent references to the option of the Council. These permits should not be allowed—nor, indeed, should they be necessary in a measure of this kind. If any references are to be made, let them be to the new Tribunal of Appeal; those to the County Council, which are so plentifully scattered throughout the Bill, should be eliminated. That is the first recommendation of your sub-committee. This Tribunal of Appeal should, I think, commend itself to the favour of us as architects, though, perhaps, we would welcome an addition to the architectural and artistic element on the Tribunal, even though it were at the cost of the existing preponderating officialism.

Part I., Section 13, may be taken as a sample of a confiscatory clause—and there are many such in the body of the Bill—where, if a fire were to occur in a building, the owner of such building would not only be a loser by the casualty, but would be a sufferer in having to set his building back to the line of frontage required by the Council. Section 14 might also be considered confiscatory.

Part II., Section 15.—Where buildings are situated on corner sites this Section should only apply to a corner site.

Section 17.—This clause should be put at the end of Part II., and made to apply to the whole part.

Part IV.—This has been the great battleground of advocates and opponents of the Bill, and it is probable—if the Bill should ever be referred to a committee for serious consideration—that on the Sections of this Part there will be some good hard hitting. The general opinion is that as drafted, the Part is absolutely impracticable, and the opinion of the sub-committee of the Association set forth in the Report and Petition is, that it must go root and branch. "There are," the report states, "serious objections to the whole part. It is quite unworkable in its present form, and should be entirely 'remodelled.'" With this fairly destructive opinion, I dismiss Part IV. and pass on to Part V.

Part V.—The rules in Section 39 should be definite, not subject to any alterations or by-laws. Here follow certain verbal amendments to the text which I will not trouble you with. There is one alteration, however, which may by many be deemed important; it is in Section 43, whereafter "as follows" is added "or such other scantlings as may be approved by the District Surveyor." Attention is called to the obscurity of Section 45. Under this Section, apparently, a person might, by surreptitiously erecting a water-closet or other small building against his neighbour's wall actually convert the whole into a party-wall!

All chimneys should be corbelled *only* above the ground floor, for chimneys corbelled in accordance with this Section would cause the walls to overhang.

Now we have arrived at a truly burning question. Should the party-walls of dwelling-houses be carried up above the level of the roof? Mr. Caroe has been kind enough to hand me a paper he has prepared on this and other points, with a request that I would read it at this meeting, and I propose, after my notes are done with, to read Mr. Caroe's views, should that course commend itself to you, Sir, and obtain the consent of the meeting.

It is proposed to insert after Section 45 the following words:—"Every party-wall of any new building, being a dwelling-house (as hereafter defined), and every party-wall of any such old building shall be carried up to the roof of such

building throughout the entire length of such wall, and the slates or other roof-covering shall be properly and solidly bedded in mortar or cement upon the top of the wall, and the roof shall be so constructed that no timber or woodwork of any description shall extend upon or across any such wall."

And Section 46 of Part V. should read as follows:—"Every party-wall of any building of the warehouse class, or of any public building, or building used wholly or principally for purposes of trade, shall be carried up above the roof flat or gutter of the highest building adjoining thereto to such height as will give a distance (in a building of the warehouse class) of at least 3 ft. 6 in., and (in any other building as referred to in this sub-Section) of 15 in. above the highest part of any flat or gutter, as the case may be."

Of the artistic gain to London streets and terraces, if these clauses were adopted, there can be no manner of doubt. Mr. Caroe is prepared with evidence on the practical question of protection from fire, and does not rest his contention for this change on any fanciful or sentimental grounds, as you will presently, I believe, hear in his own words. I now propose to read the amendments suggested in the Report and petition from Section 50 to Section 60, which I would specially mention:—

Section 50.—(6) Add "render" outside of flues where brickwork is less than 8½ in. in thickness, except where it forms external enclosure of the building.

Section 50.—(10) "Mantel" to be altered to "lintel" or "arch."

Section 50.—(15) Alter to "6 in. wider on either side than the width of the opening."

Section 50.—(22) Add "no iron girder to be placed nearer than 4 in. to the inside of any flue."

Section 51.—Add new Section "that perforated iron cresting at the top of chimney-shafts should not be allowed," as iron decays and is difficult to repair.

Section 52.—(5) Define "low pressure."

Section 53.—Should be re-drafted. It is not comprehensible at present.

Section 55.—(b) 7 ft. 6 in. instead of 8 ft. 6 in.

Section 55.—(d) Impracticable and impossible throughout.

Section 55 (f) line 15.—After "floor" add "except when constructed of fireproof materials."

Section 55 (f) line 16.—Add after "quality" or "fibrous plaster of a good quality."

Section 56.—Add "window or" and "skylight or" before "windows" and "skylights."

Section 57.—After "10 ft." add "except the lift in wells of staircases."

Section 58.—(1) Rise of arch should be stated, minimum 1 in. to the foot.

Section 60.—(2) I will not ask you to picture to yourselves London as it would look if every cornice—however deep or what its position—were limited to the projection prescribed by this section.

Mr. H. H. Statham's section of the cornice of the Strozzi Palace as erected, and the cornice as it would be if subjected to the limitations of this clause, is a lesson that may well be borne in mind.

Let us hope that even the practical and progressive party on the Council, may see the moral of Mr. Statham's "parallel." This is said on my own account, and has nothing to do with the report, where—I regret to say—no reference is made to the question. Now, to return to the report. It is proposed to omit Clause b in Section 60 altogether, and in Section 61 after "materials" (line 8) to add "and separate sets of offices tenanted by or constructed, or adapted to be tenanted by different persons, shall, if contained in a building exceeding 25 squares in area, be separated from each other where they adjoin horizontally, by proper party structures or arches of fire-resisting materials."

Section 64 is slightly amended, but Section 65 (4) and (5) the committee reported would be wholly inoperative.

Part VII.—Section 72 (3) is ambiguous, and Sub-section (6) unfair to the adjoining owner. Under this clause, the building owner could put underfootings to his new wall into the adjoining owner's room—if on that level. This the latter might reasonably object to, and it is proposed that after "owner" (line 21) should be added "below the level of the lowest floor line."

There would seem to be nothing in this Bill binding the building owner to pay for any necessary underpinning or other works to the adjoining wall. Section 75 deals with the "exercise of rights by building and adjoining owners," and the appointment of surveyors in case of disputes arising. The report states that

the arrangements made under the 1855 Building Act have been found to work well and there is no need to alter such arrangements as is suggested to be done by this section of the "London Streets and Buildings Bill, 1894."

Section 80 is slightly altered, being amended to include underpinning and the cost of doing the same.

The sub-committee would not have section 18 at any price, and the report and petition contain this clause as redrafted by the committee. It is amended form it reads, "With the exception mentioned in this Act, this Act shall apply to new buildings. Any alteration, addition, or structural reinstatement made or done for any purpose except that of necessary repair not affecting the construction of any external or party wall, or to which the rules and regulations of the Act are inapplicable, in, to, or upon any new building, or in, to, or upon any new building after the roof has been covered in, shall, to the extent of such alteration, addition, or work, be subject to the regulations of this Act; and where ever mention is hereinafter made of any building, addition, or work in, to, or upon any building, shall, unless the contrary appears from the context, be deemed to imply an alteration, addition, or work to which this Act applies."

The petition concludes with the customary formal clause, "that the Bill should not be re-introduced at any time, but that if it is to proceed, it ought to be referred to a Committee of the House, and that the Petitioners should be heard before such Committee by their counsel, agents, and witnesses against the principle and details of the Measure." If the Bill be read a second time, the petitioners pray that it may be referred to a Committee of the House, as before, with counsel, &c., and that such other relief may be afforded to them (the petitioners) in the premises as to the House may seem meet. The petition was signed by the President, two Vice-Presidents, and the Hon. Secretaries, and duly delivered through the Parliamentary Agents of the Royal Institute of British Architects to the officials of the House of Commons. I should like in this place to acknowledge the help which I have received from the Council of the Royal Institute of British Architects in connexion with the formalities inseparable from this Parliamentary work. The Council very kindly undertook the responsibility of lodging the petition with a view of saving the Association the expenses which independent action would entail.

Such, then, Mr. President and gentlemen, the attitude of this Association through the Committee, acting by resolution of the General Body, in regard to this comprehensive Bill, known by its short title as the "London Streets and Buildings Bill, 1894." My notes on the work done by the Sub-Committee appointed to report on it, are, I am painfully aware, unworthy of the importance of the subject, but I have done my best in the limited time at my disposal.

Mr. Goldsmith then read the following criticism on the Bill by Mr. W. D. Caroe:—

I have to express my great regret that I only able, by adverse force of circumstances, to appear before you, with your sanction, by proxy. There is no debate to which I should have desired to listen, than your consideration of the London Streets and Buildings Bill, which is destined to improve, or to mar, according to clauses, our great city, for many generations to come. May I venture, however, to ask you to take a hint from the prolonged debate upon the same subject which has recently taken place in this room. With but small exception—notably the speeches of Messrs. Stevenson and Statham to a perusal of which I would direct your attention—that debate might most appropriately have been heard in the rooms, say, of the Surveyors' Institution, or of some Owners' Property Defence League; architecture—architecture—seemed to be quite relegated to the background.

Now, without for one moment suggesting we, as architects, should not consider the rights of property, which I hold to have great claim upon us, I would suggest that enough has been said in this room from that point of view. Moreover, we may be sure that the Royal Institute of British Architects will be well backed up by powerful combinations of others equally, if more interested in that side of the subject, whom we may safely leave it.

We, gentlemen, are an association engaged in the study and practice of architecture, and we would venture to invite you to give this Bill consideration from the architect's point of view, and in this light I will name a few points.

First and foremost we should set our



against clauses which retain special consents to the Council, except with the greatest reservation and in cases of absolute necessity. The power of consent fosters officialism. That is quite enough to condemn its operation.

Secondly, we should oppose all clauses which will operate in exactly the opposite direction to their intention; that is to say clauses which will conduce to the undue preservation of worn-out buildings, and militate against improvements through fear of confiscation and interference. Likewise clauses which would tend to encourage underground building, as Mr. Woodthorpe has well pointed out.

Thirdly, all clauses likely to interfere unreasonably with freedom in design, or which make, or tend to make, architecture stereotyped, should have our vigorous opposition.

Fourthly, we should remember that a Building Act should not make architecture unnecessarily costly; that the poor man's house has to be cheap as well as effective, and good for its purpose; and that no matter how costly a building be, we can (or ought) never to afford to spend money upon silly fads, or fictions, or prejudices, even for the imaginary benefits of insurance companies.

In the remarkable speech of Mr. Roberts, of the County Council, in this room, on March 19—remarkable, it seemed to me, both for the justness of his reproach against the Institute, and for having otherwise uttered the largest possible number of fallacies compressible into the space of ten minutes, he told us that the new Bill had for its object "the revival of building of a higher standard than had been maintained in the past."

Now the County Council's idea of such a perfect London constructed up to a high standard of building (or architecture, I suppose Mr. Roberts meant), seems to be a London of two stories and one in the roof—so far as the Council can make it so.

If you will take an ordnance map and set up buildings limited as proposed upon the sites in any quarter where London is rich and busy, you will see how just this estimate is of the application of Part IV. to new buildings on old sites, and that the County Council has learnt to love the beautifully-ornamented productions of the jerry-builders in the suburbs, erected in the genuine vernacular of their craft, and wishes to be all London cast to the same model? Perhaps they may yet successfully appeal from the Council's eminent members, Mr. Roberts and Dr. Longstaff, the former of whom enjoys a reputation of having a real care for the beauty of London; and the latter seems to hold the honourable office of "Art Appreciator to the London County Council," an office in which we offer him our warmest encouragement.

You may, perhaps, be surprised to learn that the "shaving clause," so well called by Mr. Avenor Perry, was invented originally by the local Government Board, and has been, in a modified form, in operation in the city of Liverpool since 1890.

But, Liverpool has guarded itself to some extent. The rule applies there only to dwellings, so that buildings devoted to office and other like purposes are exempt from its operation, and proper sanitary provision is made for residential caretakers. Now, this is very different from the proposal of the L.C.C., but it must be borne in mind that what operates well in Liverpool or other provincial towns in such a matter, will not necessarily apply to London, which is mixed, as to the character of its buildings, a juxtaposition, as probably no other city in England is. Bearing in mind, also, that a tall building may make an otherwise perfectly sanitary small one too close to it quite unfit for habitation, it is not certain that the Liverpool by-law is the best, from its framers' own point of view.

It is interesting to know that already there is a proposal in Liverpool head official quarters to modify the rule by allowing buildings consisting of shops or offices on the ground floor and dwelling-houses over to be more leniently dealt with. It is suggested to allow the shops to cover the whole site, with a flat and skylight at back, and the limiting angle to be measured from the back of the flat at the first floor level. In urging such recommendation for the Metropolitan I would, however, press for a small but reasonable area, perhaps proportionate to the site, being insisted upon to light and ventilate the basement.

Now I am happy to be able to state to you that the County Council have followed to some extent the lead of Liverpool. In the printed amendments to the Bill the saving clause in all its rigour is to apply only to new domestic buildings in new streets. New clauses

are introduced to apply to new domestic buildings in old streets. Briefly stated, these determine the height by making it twice the base, or, in other words, the angle is to be 63° 20' instead of 45° measured as before.

Dwelling-houses having an area of less than six squares, and dwelling-houses to be occupied by more than two families, which are not on the public way, are dealt with by special provisions; and the height of warehouses is regulated when in close proximity to such dwelling-houses. Old buildings are not to offend against the provisions regulating new buildings in old streets more than they do at present. So far, let us be thankful; but in considering even these amendments there are two aspects of the question which must not be overlooked. By lack of sufficient space and air within it, as well as by lack of space without and around it, a building may become insanitary, and this especially applies to those buildings which are not, but ought to be, specifically defined in the Bill, and specifically provided for, viz., buildings erected and used chiefly for purposes of trade or commerce, and which, therefore, are occupied during the day by a large number of employees.

If the air around such a building be somewhat confined, it will still be fresher than the air inside an overcrowded building surrounded by the freshest air.

It is in this sense that that enthusiastic adulator of the London County Council Bill, Mr. Williams, mistakes in large measure the substance for the shadow, and in measuring his carbonic acid confounds the density and dirtiness of the inmates with the quantity of the buildings upon a given area.

I mention this point specially in connexion with the proposal to allow shops to cover most of the site, as one deserving much consideration, and as an antidote to any too drastic laws, framed for the admitted importance of getting rid of and preventing the erection of rookeries, but applicable unduly to buildings of quite a different character.

The decrease of habitable space proposed under the operation of the Bill—even as amended—means, necessarily, the increase of the borders of the City. One may well ask where the fresh breezes are to blow from which are to keep the centre of the City in health, if still greater spur than exists already be given to its spreading out into the surrounding country.

Finally, in this connexion, I would protest on the score of sound construction, of dignity in architecture, and of breadth of design in our new streets, which (when the County Council has swallowed the lollipop of betterment) we hope may be many, against any rule which has angular measurement for its chief factor, and which would cut our new buildings into fragments of all heights and shapes, and tend to create a city of wedges, the thin end always uppermost striving to insert itself into the disabilities forced upon us by Part IV. of the Act.

With regard to general architectural considerations, a clause is required which will allow houses with their offices, stables, lodges, &c., in the suburbs to rank as one. Although each of these may happen now to be removed 30 ft. or 60 ft. from adjoining property, as the case may be, they may be within the specified distance of one another, and thus the disabling provisions of the Building Act come into force where never intended.

In all cases, provided an adequate architrave of incombustible material is used, with a definite projection, say, of 3 in., timbers in window openings should be permitted out to the wall face. We might thus be able to emulate some of the charming façades which are special features of the city of Bath.

What slaves of circumstance we truly are in such matters! The present Building Act was regulated to suit the exigencies of the stucco Victorian era of Classical or Renaissance architecture, in which the detestable window reveal was desired. To secure it, perhaps, a sham fire scare was created, or may be its originator held a brief from the insurance companies, and got them, like Mr. Hall, to threaten increased premiums to further his wicked architectural ends!

But the shop front and stable builders were too strong, and had their own way, despite the insurance companies. Cannot we now follow their good example?

This suggests to me to deal with party-wall parapets and Mr. Hall. You are aware that Dr. Longstaff himself suggested, in his admirable speech at the Institute, the very reform which I had separately been advocating, and based his views upon those of the architect to the Local Government Board. One would have thought

that any architect would have welcomed and made the most of Dr. Longstaff's excellent and unexpected lead. Mr. Hall, however, seems to have made advocacy coming from such pernicious quarters the very ground for raising any and every obstacle against the proposal.

He accordingly goes to the insurance companies and accepts their *ex parte* statement—to him no doubt gratifying—that if the reform is carried they will raise their premiums. He ignores the evidence I have brought before him of the admirable working of the arrangements in Liverpool, Manchester, Belfast, Leeds, Bradford, Huddersfield, Sheffield, Leicester, Cardiff, &c., as well as the unbiassed expert views as to the non-spreading of fires.

Mr. Hall did not ask his insurance companies if they charged the same premium in these cities as they do in London, for reasons which perhaps he can explain, though it would have seemed the right way for a delegate of the Royal Institute of British Architects to proceed. I can inform him, however, and ask you to note this—showing how readily he allowed himself to accept the bogus statement—that the same rate for dwelling-houses is charged by the same companies in these cities as in London. It is interesting, too, to observe, that in Liverpool, where—as one of the leading officials informed me, they would be prepared to resist the unnecessary infliction of party-wall parapets, the Fire Salvage Association, corresponding to the London Fire Brigade, is organised by and in the hands of the very insurance companies, with others, whose London "officers" Mr. Hall has been accepting the *ex parte* statements of. Really I think that Mr. Hall has given himself away in this matter, and dealt hardly with the excellent reputation he had established among us for good common sense.

In contradistinction to his perversity, and that of other members of the Practice Committee of the Royal Institute of British Architects, I should like to record my appreciation of the open-minded consideration of your Sub-committee and Committee, who have adopted some draft clauses which I had the honour to prepare. With your assistance, therefore, I hope we may tell Mr. Hall that he has not so readily "settled the whole question" as he may suppose.

I might tell you that Mr. Hall introduced me to one of his insurance champions, to whose blandishments he expected me, no doubt, to fall as ready a prey as he himself had done. I found, however, that this gentleman did not seem fully aware what a party-wall parapet was, had never properly considered its existence or non-existence, and he also informed me that "fires did spread sometimes through defective party-walls." That I could have taught him; and for that reason and others I have advocated the admirable Liverpool system of "Separate side walls."

But that is another story, with which I will not now trouble you.

Serious injury will be done to design if a mansard roof cannot have a steeper angle than the 75 deg. proposed; 83 deg. at least, should be possible.

Grave interference will accrue to certain forms of plans necessary on confined sites, by the operation of the sub-section, dealing with light and air in the wells of houses.

The clause relating to the enclosure of lifts, which is amended so as to permit of lifts in wells of staircases requires still further amendment.

We should be grateful to the London County Council, and specially, I am told, to the advocacy of Dr. Longstaff and Mr. Roberts, for their allowance of certain projections in which they are again following the lead of Liverpool, though why basins should be confined to two stories is not very clear.

One would like to see clauses introduced for the encouragement both of reasonable projections and gables in street fronts. Moreover, under given conditions, the clause that one wall may not overhang another, should be inoperative if the construction can be carried out to the satisfaction of the District Surveyor. The advantage and importance in design of having limited freedom—even to a few inches—will come home to all of you.

The limitations as to cornices, so ably exposed by Mr. Statham, should be amended.

The projection should be measured by the amount it overhangs the public way, and should be allowed to vary with the width of street, so as to thus encourage setting back if a great projection is required by the designer.

I will not now discuss the definitions which must be radically redrafted, but there are several questions over which I, for one, would



gladly give the Council control. The regulation of lighting conductors, overhead wires—or possible railways—lamps and lamp-signs, whether of public houses or public conveniences, in connexion with which vestrydom seems to be exhibiting so much “good” taste. Some sumptuary laws would certainly be useful in these matters, and if the Council like to extend them to the regulation of meretricious terra-cotta and other ornament (save the term!) in our streets, we, as artists who never do such things, need not utter any complaints!

Mr. A. O. Collard, who initiated the discussion, said those who had the opportunity of listening to the remarks which Dr. Longstaff, the Chairman of the Building Act Committee of the London County Council, made at one of the meetings of the Institute, would have learned that the County Council apparently were not so keen on passing the Bill as it stood as people might suppose. The chief reason why the County Council wished to push on the Bill was that the matter had been hanging fire for such a long time, and they felt that unless something was done pretty soon, in however crude a manner, the Bill would be delayed by a new election of councillors. The Bill was the production of many people, who brought their minds to a subject which they did not understand, and the storm of opposition which had very properly arisen was pretty well what they expected and what they wanted. By the help of the various bodies who had petitioned against the Bill, they would probably produce something better than the evils which architects had to suffer now. Altogether, about forty-two petitions had been lodged against the Bill, and the Chairman of the London County Council had informed him that they would be taken into consideration and dealt with on their merits; therefore, what this Association and other public bodies did in the matter would have a considerable effect in improving the Bill. Proceeding to criticise various clauses of the Bill, he said the County Council undertook to either approve or refuse an application for the formation of a new street during the space of three months. They all knew what delay meant, and it was a question whether the County Council should not be coerced into doing things a little smarter. He thought two months was quite sufficient time for them either to approve or refuse such an application. It was stated in the Bill that a new street must be open at both ends. The old definition was preferable, because it said a new street must be open throughout from end to end. He supposed other clauses of the Bill were meant to apply to the middle of the road. The clause with reference to the pulling down of buildings was really a fearful thing, because directly they pulled down a certain portion of the building, the County Council came and said: “You must not rebuild, or if you do you must set your building back.” Under the Bill, the County Council would have power to give compensation, but supposing anyone was unfortunate enough to have a fire, this misfortune would not be met by insurance money, because during the six or twelve months of rebuilding one’s business would be lost. By Clause 27 the superintendent architect was given power to determine in which street a building was, and no appeal was possible against his decision. In many cases it was difficult to decide which was the front of a building, and the result might be disastrous to the owner. Having briefly alluded to the angle of 45 deg., the height of buildings, &c., he said absolute confiscation was the order of the Bill, and the Progressive Party of the County Council did not seem to mind inflicting pains and penalties on people who had property. As to the height of rooms, if they insisted upon a height of 8 ft. 6 in., they might as well suggest 10 or 20 ft., because, as a matter of fact, 8 ft. 6 in. was a tremendous height for an attic. With regard to party-walls, he believed most people considered that the old clause of the 1883 Building Act, with reference to deciding any disagreement, worked very well, and did not require any alteration. It was proposed to deal with timber stages on the confiscation principle, and the clause, as it stood, would prove a great hardship to London timber merchants. As regarded the Tribunal of Appeal why, he asked, should they have a member appointed by the Council of Civil Engineers? They did not admit that civil engineers were of much use in matters of building, and the same remark applied to one or two of the other gentlemen who were to be members of the Tribunal. Members of the Tribunal were to be appointed

for a term of three years, and three would form a quorum. If they adhered to their suggested number and description of members, it might very often happen that an architect member might not be able to join the Tribunal, and then it would be left to the civil engineer, the surveyor, and some outside gentlemen of leisure to decide the most knotty point of architecture. He did not think anything was mentioned in the Bill with regard to public-house lamps. Some of these lamps were most atrocious things, and he wished the County Council would take upon themselves to give the district surveyors the power to deal with them. In conclusion, he proposed a vote of thanks to Mr. Goldsmith for having placed his own views and those of the sub-committee before the meeting, and also for reading Mr. Caroe’s notes on the subject.

Mr. C. H. Brodie, in seconding the motion, said there were certain general principles, which were violated in the Bill, on which one might say a few words with advantage. They were often told that they did things better in France. He could not conceive the possibility of such a Bill, which was not even decently worded, being launched into the French Chamber. Directly a Bill of this class had been talked of the French Council or the Government would have called to its aid the best professional advice obtainable in the country. Such an idea seemed to be utterly foreign to the County Council. They simply scoffed at the professional bodies in the country, and the result was that they launched a Bill which in many of its clauses was not even sensible. He was extremely glad in this connection to hear Mr. Caroe’s well-expressed and certainly well-deserved censure of Mr. Roberts’s remarks at the recent meeting of the Institute. Dr. Longstaff and other gentlemen added insult to injury when they came to the meeting of the Institute and told the members that they did not offer any help. He (the speaker) wondered what would have been the result if they had offered to help. As a matter of fact nobody had the opportunity of saying anything about the Bill until it was launched. Dealing with several clauses of the Bill, he spoke in condemnatory terms of the 45 deg. angle, and with reference to the height of rooms said that 7 ft. or 7 ft. 6 in. was quite enough. The District Surveyor hereafter would not necessarily be the reputable gentleman they had now as District Surveyor. He would not be a man of large views, but similar to a sanitary inspector, or any other official, and those who had to deal with that class of gentleman knew what sympathy they would get in erecting a building, artistic or otherwise. He then spoke in favour of the publication of the bye-laws, which, he thought, should receive the sanction of the Government authorities. Five, he considered, was an unnecessary number for the Court of Appeal, and its composition was not what could be desired.

Mr. S. B. Beale expressed regret that the Association took so little interest in the subject, judging from the small attendance. He did not wish to introduce any discordant note, but he must say that he did not agree in a great many respects with the representations which the committee were making in regard to the Bill, nor could he join in the conclusions arrived at by Mr. Brodie or Mr. Collard. He was, perhaps, more progressive than conservative, but he did like to see a wider street in London than generally pertained, and the hardship of a fire, to which Mr. Collard had referred, did not seem to him to be so great as he made out. Fires, in his (the speaker’s) experience, had not been without their compensating advantages. In other respects, in which this Part I. was stated to be confiscatory, it seemed to him that the buildings which were pulled down in order to be rebuilt would not be pulled down unless the lease had run out. When the lease of land ran out, the building interest, he took it, ceased. In the event of the County Council proposing to widen the road on which this land abutted the ground landlord surely could not claim the same ground rent for the smaller plot as he had received in the past. Therefore, he did not see how that could be a hardship upon the lessee. With regard to the building angle line in Part IV., confiscation was also alleged. Now, it seemed to him that if they made a building only half the height that they could do under the old clause, the revenue therefrom would be proportionately reduced, but so would the expenditure of capital. Capital would thus be spread over a wider area, and this would in no sense be a hardship upon the lessee. Generally speaking, he held the broad view that the great landlords of London should have their privileges trampled upon. The

objections which had been urged against the Bill apparently came from a most unique set. They were told that gas companies, railway companies, and other great capitalists were among the petitioners against the Bill. It seemed to him, therefore, that they had capital waging war against the interests of the community. The poor people in the crowded areas and overpopulated districts of London who were going to benefit had not lodged a petition against the Bill. As far as he could see the recommendations of the committee followed in the lines laid down by the Institute, except with regard to the party-wall business, which was diametrically opposed to the Institute’s recommendations.

Mr. Goldsmith remarked that the committee had their objections prepared before the meeting of the Institute.

Mr. Beale (continuing) said, in reference to party walls, the committee thought it desirable that a clause should be inserted in the Bill stating that no wall should go up through the roof, but that the roofing material should be bedded on the wall. He thought they might have taken up a less positive attitude, and said that it should be optional whether a wall should go through the roof or not. With regard to the projection of cornices, he entirely disagreed with the idea of having a higher maximum than 2 ft. 6 in., which in all conscience, was enough for any building. There were many styles of architecture which might be used, and on almost any scale they would not demand a cornice of greater projection than 2 ft. 6 in. With regard to the composition of the Court of Appeal, he considered that a civil engineer would be a very useful member, because railways and gas-works might be affected by the Act, and he would no doubt appreciate the point in connexion with these better than an architect. Unfortunately, he disagreed entirely with Mr. Brodie in his views of confiscation. It seemed to him (the speaker) that the Bill was conceived in a right and proper spirit. If the Bill did pass, as he hoped it would, modified in some respects by the suggestions of the various technical bodies who had discussed it, but maintaining its principles of widening streets wherever possible, and giving compensation where damage had been rightly sustained, in forty or fifty years’ time London might have some claim to be considered, as it had been in the past, the finest city in the world.

Mr. Banister F. Fletcher remarked that if Mr. Beale studied political economy he would find that the interests of the landlords were very often the interests of the people. With regard to the composition of the Tribunal, he would even go so far as to propose as a member such an aesthetical gentleman as a member of the Royal Academy. He was entirely against fettering architectural design in any way. The projection of cornice was a question of pure architectural design, and he thought such a matter ought to be left entirely to the discretion of the architectural designer as long as it did not interfere with the public convenience.

The vote of thanks was then passed by acclamation.

Mr. Goldsmith briefly acknowledged the compliment, and the proceedings then terminated.

**ARCHITECTURAL ASSOCIATION—DISCUSSION SECTION.**—A meeting of the Discussion Section of the Architectural Association was held at the rooms of the Association on the 5th inst., when Mr. F. G. W. Buss read a paper on “Quantities.” A letter was read from Mr. A. O. Collard, who had promised to open the discussion, but had been called away from town, giving a *résumé* of his opinion on the point raised by the paper. Mr. S. B. Beale opened the discussion, which was continued by Messrs. W. H. White, J. C. Stockdale, H. F. Williams (a visitor), W. B. Hopkins, C. H. Strange, Max Clarke, and the Chairman.

#### COMPETITIONS.

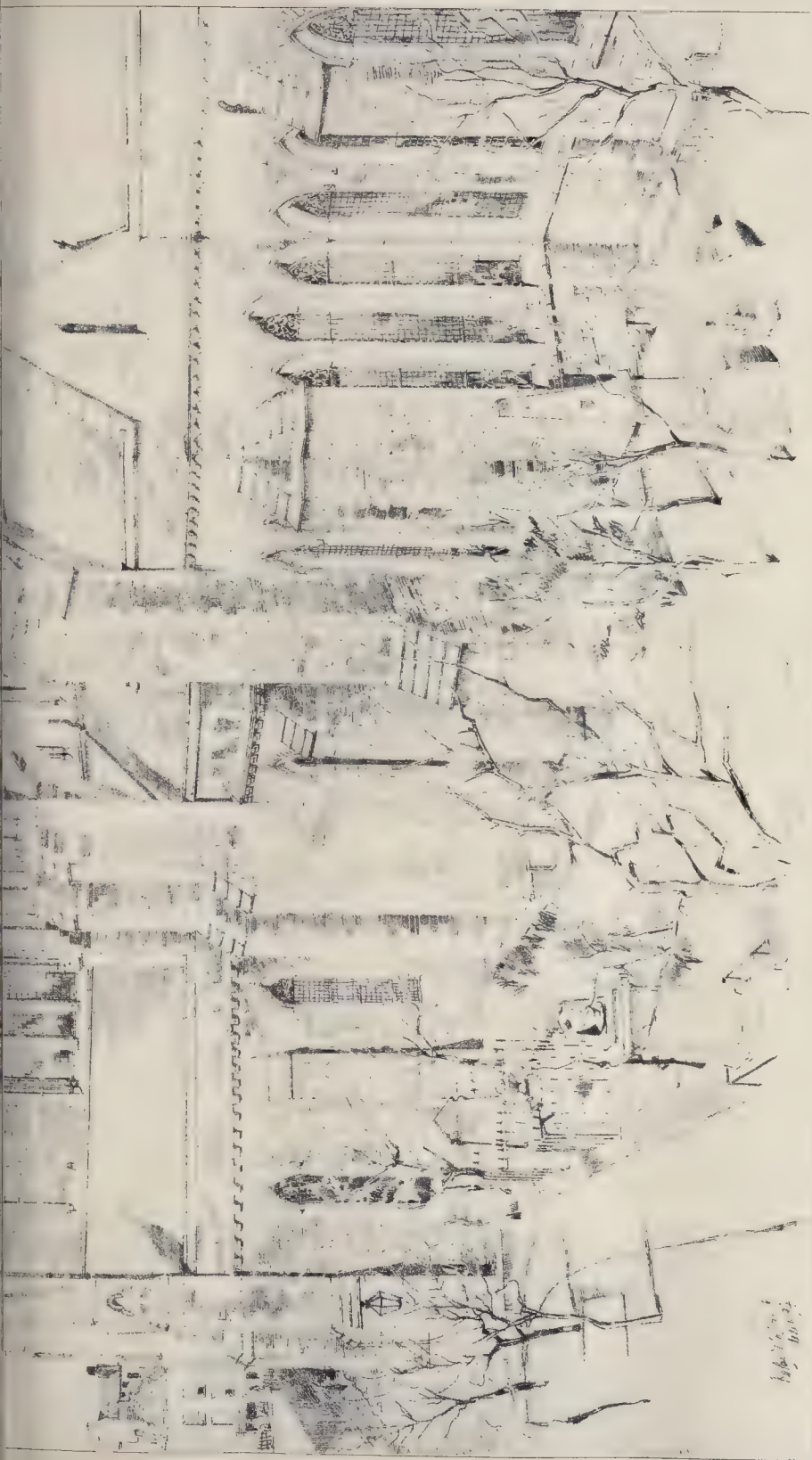
**TOWN HALL, HAMMERSMITH.**—The plans for the proposed Town Hall at Hammersmith were considered by the Vestry of the Parish at a meeting on Wednesday, and it was decided to adopt the recommendation of the Town Hall Committee that the plan submitted by Mr. A. Richardson, of Uxbridge-road, Shepherd’s Bush should be accepted. The recommendation was based on the advice of the assessor, who had placed the plan submitted by Mr. E. Mountford of Buckingham-street, Strand, second; the third being one from Messrs. Isaacs & Florence, Gray’s Inn-road. The estimated cost of the building is 25,000*l.* After a long discussion was decided to refer the matter to the committee to consider what steps should be taken with regard to pressing the matter forward.





THE BUILDER, APRIL 7 1904





THE PHOTOGRAPH BY MR. R. A. S. LESTER, HARDING, COLLET, PETER AND S.

ANCIENT CATHEDRALS OF IRELAND.—DRAWN BY MR. ROLAND W. PAUL.

No. 1. ST. PATRICK'S: FROM THE SOUTH-EAST.





## LONDON STREETS AND BUILDINGS BILL.

The architects and surveyors have taken the opportunity of expressing their opinions on this Bill, and we now have before us the Report of the Joint Parliamentary Committee of the Institute of Builders and the Central Association of Master Builders of London, appointed to consider the subject. As the opinion of the Builders on some of the points in the Bill will be of interest to many of our readers, we print the report in full:—

The objects of the Bill, as set forth in the preamble, are said to be shortly (after giving a list of Acts of Parliament, thirteen in all, which control or regulate the laying out of streets and building operations in the Metropolis at the present time, and that the provisions are complicated, doubtful, and insufficient) to secure a proper width of street, and construction of buildings, diminution of danger from fire, more light and air, and space under buildings, and a more uniform application of the provisions of the Acts throughout the Metropolis. It is agreed that it is most desirable that the present disjointed legislation dealing with these matters should be consolidated and simplified, and that the more uniform in application, and so that existing rights are protected and conserved, support should be accorded the Council in their object.

## PART I.

relates altogether to the formation of new streets and ways, and the widening of existing streets and ways. There appears to be a marked distinction in principle of the proposed legislation and existing enactments in this particular, that whereas under the existing law if a person lays out his street in accordance with the requirements no consent is necessary, in future, if the Bill becomes law, nothing is done unless consent has been obtained.

Clause 2 provides that applicants must furnish a plan and section, *with such particulars in relation thereto as may be required by the Council.* The italics appear calculated to give trouble to applicants, and afford pretext for delay in dealing with applications, and objectionable from this cause. Further information is required should be clearly pressed in the clause.

Clause 4, Section 7, appears to be most objectionable, as it gives the Council authority to refuse its sanction to any street proposed to be laid out in a manner as to be in contravention of any by-law of the Council, and will undoubtedly greatly increase the difficulties of persons in developing their land.

Clause 7 gives the Council authority under certain instances to require a street to be laid out with a width not less than 40 ft., but of not greater width than 60 ft.

Clause 9, Section 1, provides that no new building, structure, boundary or fence shall be erected at a distance than the prescribed distance from the line of the roadway, without the consent in writing of the Council; but if compelled by the necessity to set back a greater distance than 20 ft. from the centre of the roadway, Section 3 gives the Council the right of appeal to the Tribunal of Appeal, to which reference will be made later on in report.

Clause 13 provides for setting back existing buildings when pulled down or otherwise involved in building, and, it is presumed, is in substitution for provisions of Michael Angelo Taylor's Act, as amended, which provides that the Council may, at its discretion, require the owner of a building to set it back from the line of the roadway, or if not so agreed, determined by the Tribunal of Appeal. This appears unsatisfactory, under the definitions in the Bill, owner is limited; in a case of this nature there may be a number of persons interested, and the clause should provide all persons injuriously affected being properly notified. The Tribunal of Appeal is not the proper court for dealing with the matter, and the matter should be settled by arbitration under the Arbitration Act of 1889, or else under the provisions of the Lands Clauses Consolidation Acts.

It is presumed that the restrictions imposed in all other clauses as to building frontages are added to apply to new undertakings; but having regard to the definitions in the Act of Building and the Bill, it is absolutely necessary that a clause should be added saving existing rights and putting all streets and roads laid out before the coming into force of the Act, and securing to frontages, all existing rights.

## PART II.

Clause 17 deals with the general line of building and the roadway, and the clauses incorporate the provisions of the existing Acts, but clause 17, providing for an appeal from the decision of the Surveyor, should be at the end and cover the whole of the clauses 15 to 21.

Other clause should be added, providing that the Council should in every case where conditional notices are given, keep a register of them open for inspection.

## PART III.

incorporates the provisions of the existing Acts.

## PART IV.

Is most part new, and is of a most drastic character.

Clause 29 is to meet a difficulty, which has been experienced in many instances, and is designed to prevent a house being built in such a way that a proper road could not be formed to it.

Clause 30, Sections 1 and 2, are the existing restrictions practically unchanged, and should be reasonably sufficient; but Sections 3 and 4 are impracticable and ridiculous. What particular virtue there may be in the angle of 45 deg. is best known to the framers of the Bill, but it is simply nonsense to pretend that either light or air is regulated or controlled by the angle of 45 deg., or any other angle, and if the height of houses is to be limited by the width of the street they are situated in, and a sufficient open area is secured at the back, it may be assumed that both light and air will find their way to them. If the open space provided at back is insufficient, then provide more; but to endeavour to extend throughout the Metropolis the architectural plans which have had to be adopted in the narrow streets and lanes in the most crowded parts of the City to avoid interference with valuable light, is a proposal which should require to be made clear to Parliament to ensure its rejection.

Clause 31 should provide for compensation being paid as is suggested in Part IV.

The remaining clauses of this part of the Act do not appear objectionable, and some of its provisions useful, removing some existing difficulties, particularly Clauses 33 and 38.

Unless the saving clause is put in Part I, as suggested, Clause 9 read in conjunction with Clause 33 will work great hardship.

## PART V.

Is in great part an incorporation of the existing provisions, and where new matter is introduced not of the most judicious character, instance Clause 43; it is very undesirable that floors should be constructed in the way indicated, and the two last lines of the schedule should be struck out.

Clause 45 should be amended by providing that a wall should only be deemed to be a party wall so far as it is actually used as a party wall, and where between buildings of different heights, to a height of 10 ft. above where the roof of the lowest building abuts against it.

Clause 37 should be struck out, as it is utterly impracticable, and would lead to serious accidents.

Clause 60, Section 5 requires to be enlarged to include verandahs and porticoes.

Clause 61 reduces the area of chambers from 36 squares to 25 squares, and the old limitation should be restored.

There should be a clause added to this part of the Bill to remove all misapprehension as to its application and securing existing rights.

It should be made clear that a building erected in flats can be served by a common staircase. See Clause 185, Sub-section 24.

## PART VI.

Appears to simply incorporate existing legislation.

## PART VII.

Clause 72 is new, and provides for a deficiency in the existing provisions.

Clauses 73, 74, 75 are generally in accordance with existing provisions, but there appears to be a clerical error in Section 8, line 5, where word two should be used instead of word three, otherwise it would prevent the two surveyors making an award without the intervention of the umpire; and this observation also applies to section 9, line 12.

Clause 80 is incorrect, as the provisions for payment of the adjoining owner of his share of the expenses of building or rebuilding a party wall should extend to a future user of the wall; this is made to apply to the user of a party fence wall, and should apply equally to a party wall.

Clause 84.—It is desirable that a register should be kept of all cases to which this provision refers.

## PART VIII.

Appears to be a simple incorporation of existing legislation, but in Clause 98, Section 3, it would appear more convenient that the orders should be at once registered, and that the property should not be affected by the order unless so registered.

## PART IX.

Appears to be entirely a sanitary question and does not call for any comment.

## PART X.

Is an incorporation of the Act of 1893.

## PART XI.

Is also a reprint of the Act of 1891.

## PART XII.

Is generally in accord with existing legislation; but Clause 122 appears to provide that notice is to be given for any work, no matter how trivial, and the clause in the present Act should be restored excepting works of repair not affecting the construction of any external or party wall.

Section (b) should be three months as now, instead of one month.

Clause 128, Section 1, should be amended providing that the order should not be made *ex parte*.

## PART XIII.

Clause 136 appears to give the Council almost unlimited scope in framing By-laws, and words should be inserted securing that they should only have power to frame them within the four corners of the Act, and especially restricting them from unduly controlling the plans of buildings.

The penalties in lines 18 and 19, page 73, are excessive; 50s. being substituted for 5l., and the continuing penalty of 5l. for that of 2s. per day, in the Act of 1878.

No by-law is required for dealing with matters specifically dealt with in the clauses of the Act.

Section 3 should contain the same provisions as regards objections being made to and heard by the Secretary of State as is contained in Section 16 of the Act of 1878.

Section 4 should be amended providing that a copy of the proposed by-laws shall be sent to the Institute of Builders.

Clause 144 provides that all penalties shall go to the Council.

Clause 149 requires alteration so as to make clear who is the owner; and Section 3 should provide for the arbitration to be under the rules of the Act of 1889.

Clause 150.—This should be amended giving the power of appointment of a member to the Institute of Builders.

Clause 159.—Fees should be subject to the approval of the Secretary of State.

Clause 163 should be amended so that it should be obligatory for a notice to be served on the builder by sending it as a registered letter and not in the alternative.

Clause 174 should be amended exempting all works in progress at the time of passing the Act.

Clause 175, Section 7, should be struck out altogether.

Clause 179 deals with offences against the Act. This is a very comprehensive section which requires to be very carefully examined with the Bill itself, or the shape in which it should finally pass the Committee of the House, as it is cumulative in its terms, and leaves the amount of the penalty for which a builder may be liable—in addition to the other penalties provided by the Bill—to be fixed by by-laws to be passed by the Council itself with the approval of the Secretary of State, and Section 27 makes an offender liable in addition to the penalties under the Act to other penalties which may be imposed by the Council under any by-laws framed by them. This appears objectionable, especially having regard to Clause 144, which secures all penalties to the Council.

Clause 185 deals with definitions, and, though voluminous to a degree, is anything but clear and definite. Sections 1 and 2 require to be amended so as to provide for dealing separately with existing streets or ways and new streets or ways.

Sections 6 and 7 are very wide, indefinite, and impracticable. Section 8 is also wide and inconsistent, and, if to be taken literally, ridiculous. Section 32 is still more unsatisfactory, and it will be seen by reference to the term owner where it occurs in the various clauses of the Act that the definition of owner here is incomplete and inconclusive.

There is nothing else that calls for any notice under the second schedule, which gives a list of fire-resisting materials. Section 124, dealing with the composition of mortar, should be amended by adding broken brick. Section 5 is not satisfactory, and the composition of concrete can be as easily stated as that of mortar, and it should be so stated to secure a uniform practice throughout the Metropolis, instead of leaving it to be decided by the various District Surveyors.

The third schedule settles the fees to be paid to District Surveyors, and varies considerably the present practice and increases materially the amount which will have to be paid in the future, and should be carefully revised; especially in Part I, it should be made clear that these fees include all works involved in the erection of a new building."

PETITIONS AGAINST THE LONDON STREETS AND BUILDINGS BILL.—A further batch of petitions against the London County Council's Streets and Buildings Bill has been deposited by the School Board of London, the Ecclesiastical Commissioners, the London Chamber of Commerce, the Institute of Builders, the Surveyors' Institution, the Strand District Board of Works, Associated Landowners and others, owners, lessees, and occupiers of lands and buildings in London, the South Metropolitan, Wandsworth and Putney, Commercial, and Crystal Palace District Gas Companies, and the Midland, Metropolitan District, London and South-Western, and London, Chatham, and Dover Railway Companies.

PROPOSED IMPROVEMENTS AT HARROGATE.—It is proposed to erect at Harrogate a new fire-engine-house, together with a drill and cleaning room for the men. The structure will adjoin the market, and will be of similar elevation, and the building will be surmounted with the Borough arms. The Corporation also intend to provide increased lavatory accommodation at the market, and convert the corners in Station-square and the Market-place into shops, with suitable rooms also for the use of the Lighting Inspector (Mr. Smith). The Borough Engineer (Mr. S. Stead) has the plans in hand.



## Illustrations.

ST. PATRICK'S CATHEDRAL, DUBLIN.\*  
By MR. THOMAS DREW, R.H.A.

**T**HE City of Dublin has the unique position among cities of the United Kingdom of possessing two cathedrals, and both, for the most part, of the same age. That they were originally rival foundations, for some reason, must be evident; yet they have been co-existent, and, withal, with many contentions, and rivalries, and *querrels*, as their records say, have lived within bow-shot of each other for seven centuries on fairly harmonious terms, as Irish things go. The historical origin of the two foundations might perhaps have been told more consecutively if the series had commenced with the older and precedent foundation of the Cathedral of the Holy Trinity, commonly called Christchurch—*i.e.*, cathedral or head church in Scandinavian speech, for the older church is a Danish foundation.† In 1033 Dublin was and had been for three centuries an exclusively Danish stronghold. After the power of the Danes was broken in a decisive battle at Clontarf, near Dublin, in 1014, the survivors became Christianised, and Sigtryg Sikkbeard, the local king of the Dublin Ostmen, founded a church in honour of the Holy Trinity at Dublin, anno 1038, and established a community of secular canons. Later on came the invasion and immigration into Ireland of Anglo-Norman adventurers in 1161, and the Earl of Pembroke, commonly called Strongbow, and his companions Raymond-le-Gros and Fitzstephen joined with the Celtic bishop, Lawrence O'Toole, whom they found in possession, in rebuilding the Cathedral of the Holy Trinity, and identifying it with English rule and supremacy. So it has continued to be, and has been the recognised Chapel Royal down to recent times.

The erection of a second cathedral is due more to ancient jealousy of clerics than any dissension or schism. Lawrence O'Toole made the community of the Holy Trinity a foundation of Arrosian Canons, and brought singing men from Arras, in Flanders.

Comyn, his successor in the see of Dublin, more famous as a politician, ambassador, and courtier, a signatory of Magna Charta at Runnymede, than a priest (he was not even a priest when consecrated Archbishop of Dublin), disliked the independent, semi-Danish community which he found in this cathedral—all monastic chapters were just then disliked by Anglo-Norman bishops—they were beyond his "mending or ending." Within the walls of Dublin the masterful archbishop was subject to the iron rule of the provost and corporation, with their Danish independence, which chafed him; so Comyn began soon to start a cathedral on his own account just outside the city walls and jurisdiction. It was a fair scheme, and well-designed, yet never a full success. In fact, the cathedral of St. Patrick, Dublin, is more a study for the ecclesiologist of a *design* for a cathedral; a very well-conceived one, admirable in plan and proportions, and all the main lines of which are strangely preserved through many vicissitudes of ruin, restorations, and neglect. There is comparatively little untouched ancient work in the whole fabric now, and the details of the various restorations are departures from the ancient work; its ceilings are, for the most part, but lath and plaster imitations of its former vaulting. Yet, in spite of all its metamorphoses, the lines of the original design are singularly self-assertive and charming. It becomes interesting to trace how so complete and symmetrical model of an English church was imported into Ireland.

John Comyn, according to the Chroniclers (Giraldus Cambrensis chiefly), was the founder of this cathedral, anno. 1191. The accepted dates will not run with the record of the architecture. Comyn, no doubt, adopted for his foundation an existing Irish church, that of St. Patrick-de-Insula, just outside the city walls. The well, in which the patron saint was credited with having bap-

tised many converts, stood by it, and was only seventy years ago desecrated and filled up by the corporate authorities.

There are absolutely no records kept of the mutations of St. Patrick's which throw light on its earliest origin. Ware, the standard ecclesiastical historian of Ireland, and Mason, the learned and voluminous historian of this particular cathedral, are provokingly unintelligent about plans, and church architecture, and nomenclature. The written records to which these writers had access disappeared with them, and any true record of the foundation consists of what the present cathedral architect, Mr. Thomas Drew, F.R.I.B.A., has put together from study of ancient works and foundations, knowledge of the building before its last great restoration of 1864, and remains in outlying slums which but within the last two years were eliminated to clear a wretched and congested area around the cathedral.

At the south-west corner of the church remains a rude fragment which is irreconcilable with the symmetry and "correctness" of this correct plan of a church. It constitutes two bays of the south nave aisle, but it is arched over at about half the height of the aisle. The stone is Irish limestone. The details of capitals, &c., are rude in the extreme, and the groining and plan odd and inconsistent and puzzling—thoroughly Irish, in fact. Mr. Carpenter had the opportunity of making careful measured drawings of this cathedral as it was in 1845, when far more might have been read of its now wiped-out history; and the late Mr. Herbert Carpenter, in comparing his father's notes with Mr. Drew's, agreed with him in the theory that the original Celtic church of St. Patrick-de-Insula may have had a cloister.

If Comyn built a church, as the historians say, his successor removed it. The more reasonable supposition is that he erected the collegiate system, and perhaps the cloistral arrangement, of which undoubted traces remain. It is not inconsistent with the style of the unidentified remains of the south-west corner of the church that they should be a surviving fragment of the church which Comyn began, and consecrated in 1191.

The church, however, is plainly of later date. Historically, the two cathedrals of Dublin must be read together. They are characteristically different in plan and details, and it seems strange that so much of them remains as to enable the student of architecture to aid the historian in unravelling the tangled record of early Anglo-Norman rule in Ireland.

Thus, Christchurch, in its transepts and part of its choir, preserves and presents a specimen of the original foundation of Strongbow, and the south-west of England colonists falling into friendly relation with Lawrence O'Toole, the Dano-Celtic Bishop, and it has traces of its origin from the school of Glastonbury, and through St. David's and Valle Crucis, reaching Dublin. Then came a break in the progress of Christchurch. Founder Strongbow died in 1177. Archbishop Laurence O'Tuathal, his Irish ally, went on a mission to Rome, 1179, and never came back to his see, having died in Normandy in 1180. John Comyn, his successor, was plainly unfriendly to the Monastic Chapters and foundation of Christchurch of the Holy Trinity. The study of the buildings of the two cathedrals shows that the chroniclers are equally untrue in stating that Comyn "renewed and somewhat enlarged the quire of Christchurch," as in saying that "he built that fine spacious church dedicated to St. Patrick in the south suburbs of Dublin."

Henry de Loundres, or the Londoner, the successor to Comyn in 1112, surviving until 1228, was, as plainly as architectural history can be read, the prelate under which the existing Cathedral Church of St. Patrick was built. It is as plain as the side-lights of contemporary history can show, that he was no lover of native Irish church institutions, and shared his predecessor's distaste for the Monastic Chapter of mixed Danes and Celts and Welshmen, whom he found in possession of his cathedral of the Holy Trinity. He carried on the policy of erecting a new cathedral and temporising with native prejudices until the old community might die out. Old prejudices, however, die hard, and the older cathedral has strangely survived, maintaining its ancient precedence and traditions and jealously observing its Danish constitution, it may be said, to the twentieth century.

The plan of the Cathedral of St. Patrick as Mr. Carpenter would have reformed it is, as will be seen, a singularly symmetrical, and, in fact, a pretty one on paper. The whole cast of the design is well proportioned, and the impression

forced on the mind is that the whole originally an academic exercise of one design, mind, and that further it was a design sent out of England. Looking at the details of the architecture (which is so unlike almost contemporary work at Christchurch), feel there is a strange sympathy with such work remains at St. Mary Overie at Southwark. feel that Archbishop Henry the Londoner got design and his artificers from London, and date of the work is 1215-1220.

Probably to Henri de Londres may be ascribed the scheme of the surroundings of his cathedral. Comyn left it still a collegiate church, with *collegium* or cloister. Late research into forgotten cathedral records show that the establishment is plainly modelled on Wells. A great archiepiscopal palace and fortified precinct (now a police barrack) was established. Round the church were allocated manses for the archdeacon, chancellor, cantor, dean, treasurer, prebendaries, and a vicar's close, as at Wells, and the whole were enclosed with fortified walls and flanked towers, and a paramount jurisdiction was conferred on the archbishops as Princes Palatine in the Liberties of St. Sepulchre and St. Patrick, which were exercised until the death of Archbishop Whately in 1860. The scheme of the encircling manses in the manner of Wells, however, was a dead failure. It prettily set out outside the walls of Dublin the cleric garrison was not strong enough to hold the fort, and the lawless Celtic O'Byrns and O'Tooles from the Wicklow mountains made it uncomfortable for them. The orchards and pastures were never a success. Stanhurst tells that, "being so daily and hourly molested and preyed by their prowling mountain neighbours, they were forced to suffer their buildings to rot into decay, and embayed themselves within city walls."

Archbishop Henry, the Londoner, died 1212. Luke, Dean of St. Martin's Church, London, succeeded. There is enough to show his reverence of friendliness towards the older cathedral, the building is resumed there. The architecture of the nave of Holy Trinity fully represents the age of 1230, and a record fully establishes completion in 1235. Reverting to St. Patrick, we can recognise the next prelate, Fulke Saundford, treasurer of St. Paul's, London, and as a favorer of St. Patrick's Cathedral, and an architect can confirm the historian Ware's doubt opinion that the Lady Chapel was Fulke de Saundford's foundation. The Lady Chapel was in sixty years ago. Carpenter made a good restoration of it in 1845. We may presume that Carpenter's work is an honest reproduction. It is faultless detail as a specimen of late thirteenth-century work. It gives an impression that the choir of the Temple Church was the model which influenced this design, and that, as before, in London came the precedents that influenced Anglo-Irish Cathedral.

There was a fire at St. Patrick's in 1177, "through the negligence of John the sexton."

Archbishop Minot, circa 1381, rebuilt the injured portion of the north-west aisle, with all the difference to congruity which Medieval buildings often exhibited. The mouldings of the arches which remain are poor and straggly.

The clearstory windows, and other features which are distinctive of Bishop Minot's work were wiped out in the restoration of 1864. It does not expect much of Minot's building, we learn that he forcibly compelled sixty "fellows" who were living by begging in the town to work at the Cathedral.

Minot also built the massive "steeple," an Irish records a tower is usually called. In whole record of Medieval church buildings Ireland a spire is unknown. The plain steeple which surmounts the great tower was built by a post-Reformation bishop, Stearne, in 1711.

The northern transept lay ruined and unroofed in the last century, and had long before been assigned as the parish church of St. Nicholas. Without. It was rebuilt in unarchitectural manner about 1835 for the parish, retaining in the western aisle some Early English details.

The south transept was long separated from the church to serve as the Chapter House, and only thrown into it again in 1864. The Lady Chapel was assigned in the seventeenth century to a congregation of French residents. It was ruins when a restoration of it was begun by Carpenter in 1845. It is once again ruinous, as the Caen stone used by Carpenter

\* The series of the "Ancient Cathedrals of Ireland," which is begun in this issue, will be continued in the first number of each month, until June next. Particulars of this and of the "English and Welsh" and of the "Scottish" series will be found on page 280. The series of the "Abbeys of Great Britain" will be resumed in July next. No. 2 "Westminster," was given in our New Year's number, January 6, 1894.

† As this is nominally a series of "The Ancient Cathedrals of Ireland," we decided to commence with St. Patrick's from the feeling that there is somewhat more of the ancient interest still left in it than in Christchurch, which is now really to a great extent a modern Gothic church by Street.

\* This appears to have aroused the cathedral authorities into somewhat tardy action, for at this date, in May 1894, fire-hydrants are being introduced for the first time throughout the building.





THE BUILDER, APRIL 7, 1894.

STUDIES FOR RESTORATION — FORUM AND BASILICA — SILCHESTER

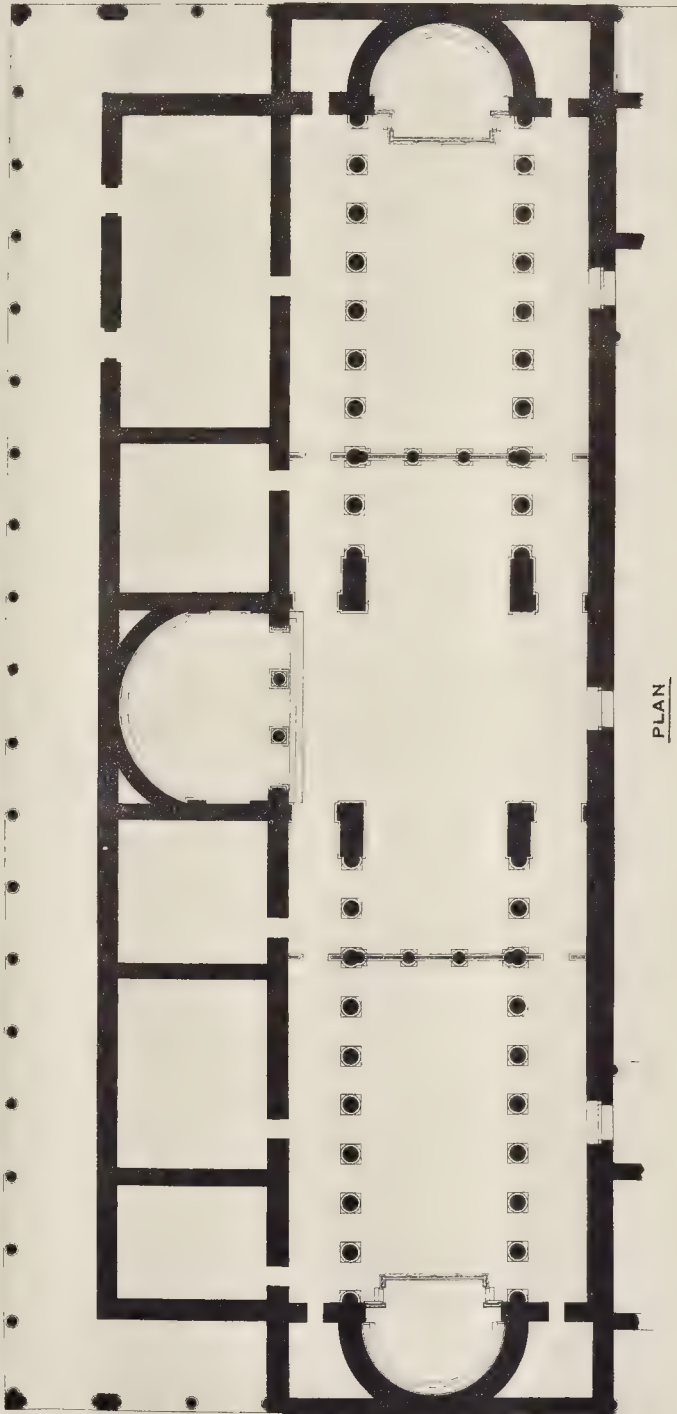
FIRST BUILDING



TRANSVERSE SECTION (LOOKING SOUTH)



## LONGITUDINAL SECTION



## PLAN

SCALE OF FEET

0 10 20 30 40 50 60 70

$$N(\mathcal{M}) = \mathcal{M} \cup \{ \langle \mathcal{M}, \mathcal{M} \rangle \} \cup \{ \langle \mathcal{M}, \mathcal{M}' \rangle \mid \mathcal{M}' \in \mathcal{M} \}$$









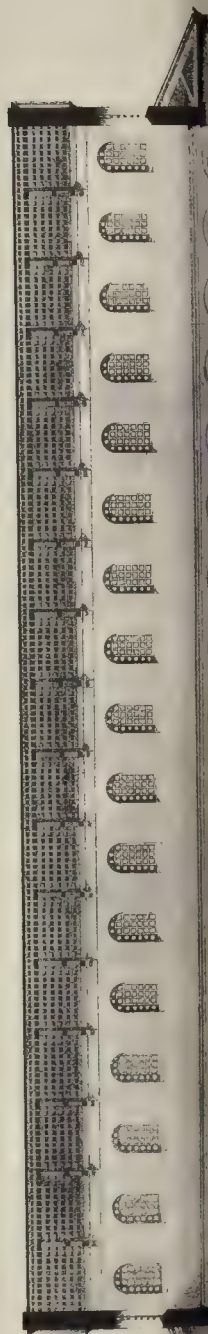
THE BUILDER, APRIL 7 1934

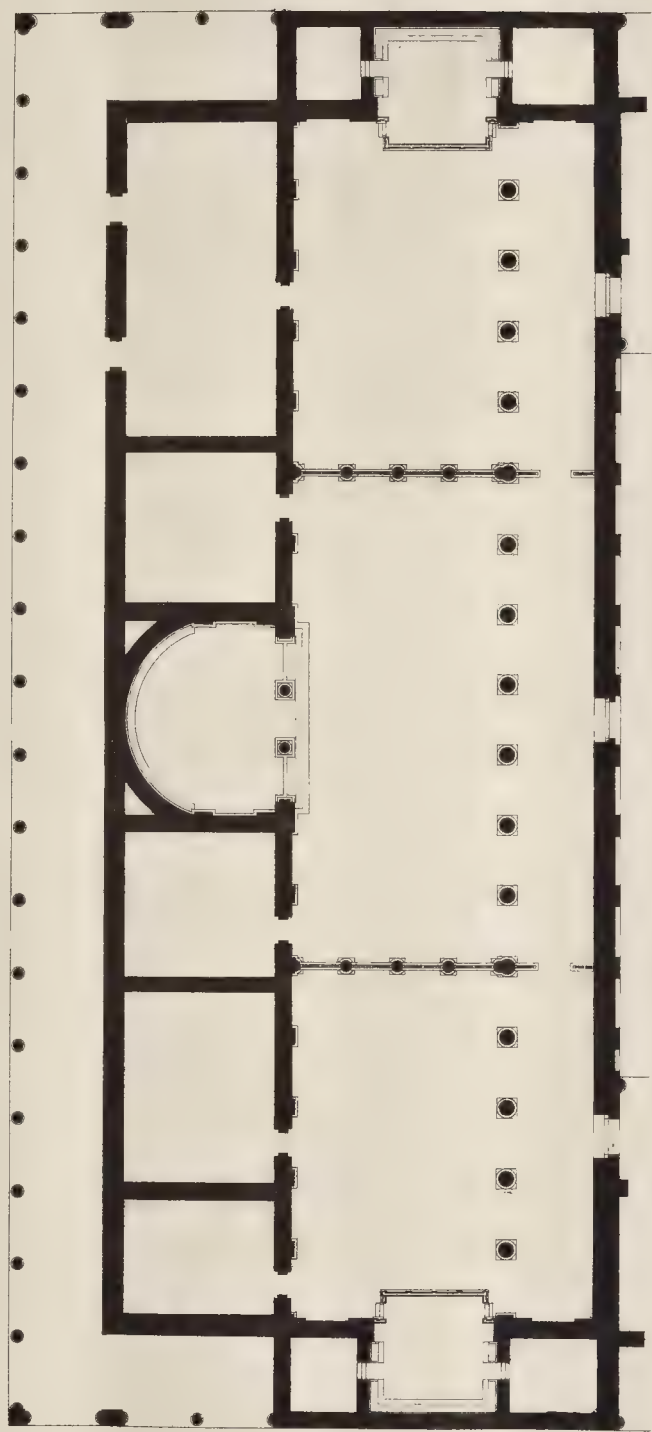
STUDIES FOR RESTORATION — FORUM AND BASILICA — SILCHESTER

SECOND BUILDING



TRANSVERSE SECTION (LOOKING NORTH)





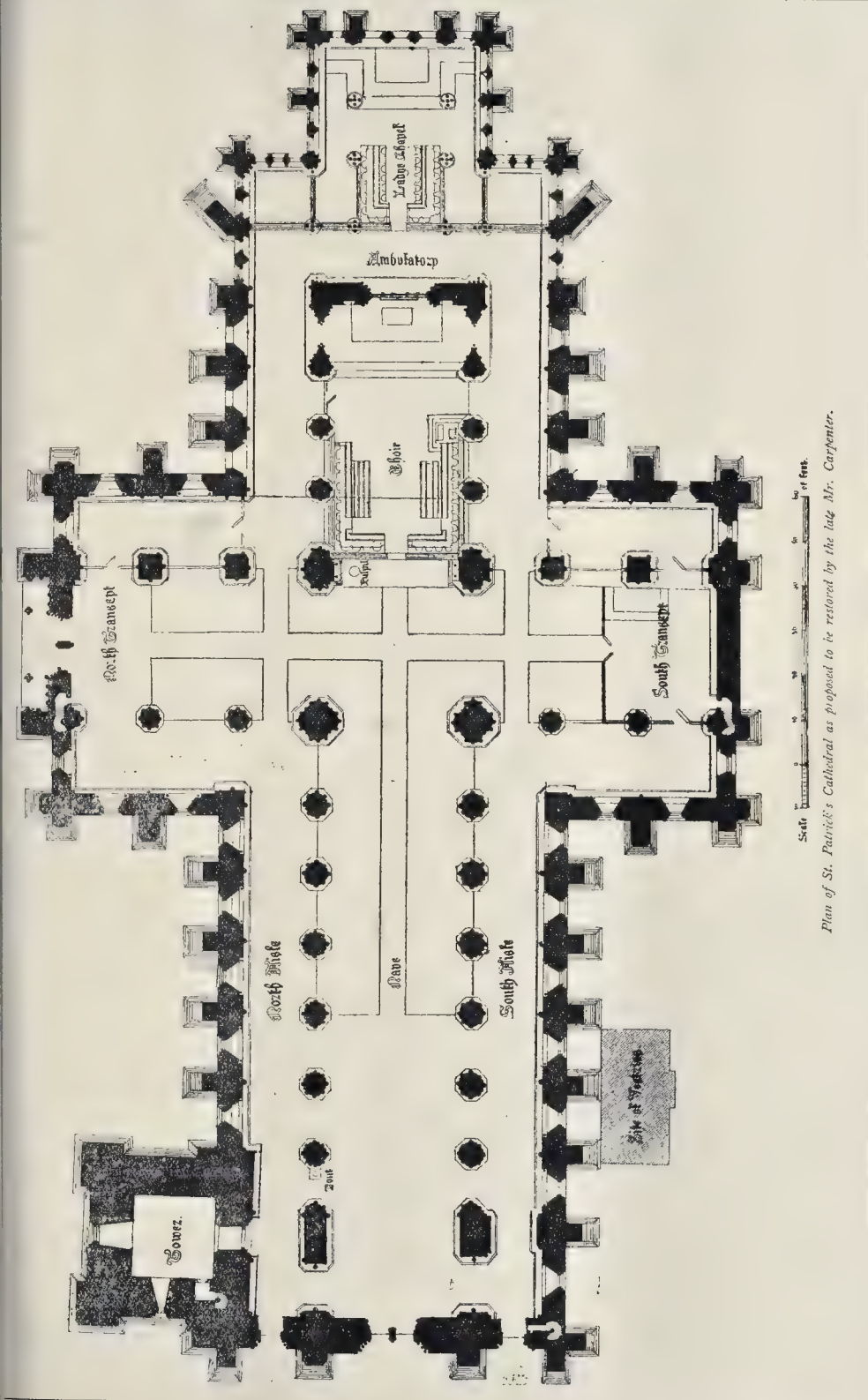
PLAN

SCALE OF FEET  
0 10 20 30 40 50 60 70

1/4" PHOTO SPACING & 1/4" x 1/4" EAST HANDING STREET 1/4" x 1/4" E.C.







Plan of St. Patrick's Cathedral as proposed to be restored by the late Mr. Carpenter.



utterly unsuited to the Irish climate. The stone roof of the nave fell in the reign of Henry VIII. and was never replaced.

The church has been flooded again and again by the Poddle River, as it stands in a low valley. Within the last dozen years it suffered one more disastrous flooding which left its carpets and chairs, &c., when it subsided, embedded in sewage!

There is scarcely a pier in the church, in consequence, which has not at some time or other been rebuilt with more or less departure from its ancient details. The choir presents most of genuine old work and has ancient stone vaulting over its north aisle. The arches for the most part preserve their ancient mouldings. The original clearstory of the south transept has been imitated in the restoration of 1864 in rebuilding those of the north transept and nave in a uniform style, which is to be regretted as wiping out the history of various periods of building. At the end of so many misfortunes and destructive forces through seven centuries it is rather marvellous that so much remains worthy of interest and study for an architect. At least its plan and general design is preserved. There would be little left for study if it had not been that it was rebuilt and repaired and saved in time by the restoration of Sir Benjamin Lee Guinness in 1864.

Its architectural value has been scarcely appreciated, and its association for most minds has been with one whose great name and individuality seem to pervade the place for the many pilgrims who resort there to see the place where Jonathan Swift lies under his own inscription—

UBI REVA INDIGNATIO  
ULTERIORIS  
COR LACERARE NEQUIT  
AM VVIATOR  
ET IMITARE, SI POTERIS  
IRENUM PRO VIRILI  
LIBERTATIS VINDICATOREM;

and near him that "Mrs. Hester Johnson, better known to the world by the name of STELLA, under which she is celebrated in the writings of Dr. Jonathan Swift, Dean of this Cathedral."

#### STUDIES FOR RESTORATION OF FORUM AND BASILICA, SILCHESTER.

THESE restorations, made by Mr. G. E. Fox, F.S.A., are fully described by him in the second article in this issue, printed under his name.

### Correspondence.

To the Editor of THE BUILDER.

#### WHICH IS THE BEST BRICK?

SIR,—Your correspondent who puts the above question certainly fairly classifies the main points to be considered in clauses *a b c d e f g*; but one is led to surmise from the remainder of his letter that he is either pre-disposed in favour of stocks, or holds a brief for manufacturers of stocks; whilst his statement that "stocks will outlast all the machine-made bricks, and perhaps even terra-cotta" is going too far. Why did the Kent and Essex Brickmasters' Association, not long since, offer prizes through an advertisement in the *Builder* for the best design of a machine to make up and press clay hitherto made by them into stocks? Again, why, at the Building Trades' Exhibition, just held, was their experimental machine, "Brething & Fawcett's Patent," trotted out or exhibited as a success, except to prove that something better than stocks were now required and demanded by engineers and architects who know their duty too well to neglect the best-known materials? and that the combined knowledge of a Kentish brickmaker and a Leeds engineer were necessary to accomplish the production of pressed bricks from London clay—with what success, however, it is too early to predicate. Instead of the statement that "Stocks are under a cloud," it would have been more correct to have stated that stocks have been supplanted by machine-pressed bricks, which are superior to stocks in every respect. One has only to travel in the neighbourhood of Cowley and other districts where stocks are made to find millions upon millions of such bricks under the clouds; whilst at Peterboro or Leicester there is scarcely a pressed brick to be found; and I know of more than one job at the present moment standing waiting for further supplies, whilst the pressed bricks have to be burnt, &c.

I have used in London and elsewhere all the classes of bricks enumerated by your correspondent and I can conscientiously assert, without fear of contradiction, that the Peterborough Pressed Bricks are the best common bricks now produced and on

\* A catastrophe not likely to occur again, through the munificence of Lord Iveagh in providing an outlet for the Poddle floods.

the market, to fulfil all the points enumerated by your correspondent.

Your correspondent further states Peterborough Pressed Bricks will not stand ordinary fire; this is, I fear, a statement made without knowledge of facts. I have selected and used Peterborough Pressed Bricks in fire-places and large boiler flues subjected to much greater and continuous heat than I should have dared to use near stocks, and after several years' exposure they are intact at the present time. As to absorption of water, I have had Peterborough Pressed Bricks tested against stocks to the evident advantage of the former, which have, therefore, been specified for town sewers and culverts.

Your correspondent may, for some reason personally, prefer the stocks, but that does not make it the best brick. Facts are stubborn things, and all go to prove that Peterborough Pressed Bricks are the best possible common bricks procurable, also that the Leicester Red Bricks are the most uniform and best facing bricks, and I assert, *ceteris-paribus*, that buildings constructed of these two classes of bricks will withstand all attacks of fire and water from within or without better than buildings constructed of gault or stock bricks.

A. M. INST. C.E.

\* \* \* Our correspondent is right in his surmise that "A Lover of a Good Brick" is hardly a disinterested critic; we did not realise until after his letter was printed that he was connected with a firm dealing largely in stock bricks, otherwise his letter would not have been printed except on condition of his putting his name to it; and if he wishes to reply he must do so under his own name. It is entirely against our practice to allow any correspondents to discuss anonymously the merits or demerits of materials in which they have a commercial interest; and "A Lover of a Good Brick" owes it only to an oversight on our part that he has succeeded in getting into our columns, in the shape of a letter, what is practically an advertisement of his own goods. One or two other manufacturing firms who write on the subject give their names openly, and therefore we print their letters.—Ed.

SIR,—“A Lover of a Good Brick” has opened a discussion upon a building material which is second only in importance to lime, where sound construction is desired.

I have used as an architect many millions of bricks, of almost all descriptions, including the four qualities your correspondent refers to, viz., stocks, gaults, Fletton, and Leicestershire bricks, and have had many samples tested at various times for crushing, strain, and absorption, and have carefully watched the effects of weather on brickwork which I have seen erected at various times during the past forty years.

The London stock is too well known to require much to be said about it. I can, however, endorse what your correspondent says of its weather-resisting properties, but it must be admitted that at the best it is an ugly, illshapen thing which can with difficulty be used in a 9-in. wall to make good work if pointed both sides and is out of the question for constructing half-brick walls in lime mortar, of which thousands of acres are built in the country in cottage property. The stock brick will not stand the pressure that either a Leicestershire or Fletton brick will. The last result I ever obtained from selected grey stocks was 110 tons to the square foot before cracking, and 164 tons before crushing, while, with a Fletton brick, I have obtained tests showing as much as 135 tons before cracking and 230 tons before crushing.

Of gault bricks there are gaults and gaults, their only recommendation, it is one, as your correspondent asserts, being that they are plastic-made, but I have generally found them brittle, and, even when less absorbent, not standing the weather so well as many other machine-made bricks.

The Fletton semi-dry pressed brick is made from a clay which is peculiarly adapted to this form of brick-making, and I think your correspondent is wrong when he says they will not stand the weather. They are of comparatively recent manufacture, but I have seen work built with these bricks twelve or thirteen years ago without a flaw in it, and showing no signs of failure. I once saw a stack of these bricks standing in the open, soaked with rain, and afterwards exposed to a very severe winter, and I could not find any that had suffered by frost, and this for a brick is a very severe test. Some clays will not stand the semi-dry process, and suffer severely when exposed to the weather. In some of the midland counties, where bricks by the dry process were made in large quantities, the manufacture is almost entirely stopped on this account, but from what I have learnt of the Fletton clay it is quite different, and yields gases which, in the burning process, assist materially to burn (not bake) the brick thoroughly. I have broken many of these bricks, and found them fused into one homogeneous lump of vitrified matter.

I cannot believe, as stated by your correspondent, that they are less fire-proof than London stocks. I have, happily, never experienced a fire in one of my works where these bricks were used, but I have frequently seen lumps of both gaults and stocks fused in a coagulate mass from over-burning, and relegated to the construction of grottoes, but I have never seen a pressed brick from the Peterboro' clay in the same condition. On the other hand, the

pressed bricks made at Fletton are used to construct the kilns in which the bricks are burnt, and I am told the kilns will last a dozen years without being renewed. This fact was vouched to me, I accepted it as sufficient evidence of the fire-resisting qualities of the brick.

In my opinion, the Fletton brick is the brick of the future for the London market, if the present price at which they are delivered in London can be maintained.

In Leicestershire, bricks are largely made of beds of very valuable clays in the coal districts, which produce bricks of very fine quality, especially for ornamental and moulded work.

I have used many millions of bricks from Leicestershire for facing purposes and in ornamental work. The clay can be worked up in the finest moulding, and preserves a very true and clean face, and, as far as my experience of them goes, it stands the weather well, and keeps its colour—a deep red. One flaw, however, in the clay is that it is sometimes apt to "salt."

For faced and moulded work the Leicestershire brick ought to be able to hold its own in the London market, where price is considered; but for common brickwork, or internal faced work, where colour is not important, I do not think it can compete with the Fletton brick, which in many of the London districts can be bought at the same price as ordinary stock.

There are other good bricks to be procured in the neighbourhood of London than what your correspondent has mentioned, and I hope some other of your readers will give us their experience of them. F.R.I.B.A.

SIR,—The question is a difficult one to answer inasmuch as a brick which is most suitable for one purpose may not be as good for another.

I have used for various works of the East London Water Company large quantities of stock, gault, and Fletton bricks.

I quite agree with the writer of the letter that well-burned stocks make excellent work, and have lately used about a million of Bray's Fletton brick for underground and also architectural work, and must also state that these have given me great satisfaction.

"A Lover of a Good Brick," or any of your readers, may see Fletton bricks in a new open house just finished for the East London Water Works Company, side by side with stock bricks in the piers and bridges of the Tottenham Forest Gate Railway, at Ferry-lane, Tottenham, and may form their own opinion as to the relative appearance of the brickwork as erected. In judgment the Fletton bricks have made by far the better work. The engine-house and the railway piers were built by the same contractors.

WILLIAM B. BRYAN, M.Inst.C.E.

SIR,—“A Lover of a Good Brick” introduced the most important question, a question which I have been endeavouring to solve for the last twelve years in the letter you published on the 31st ult.

We are makers of Fletton bricks which your correspondent considered the most important, and we have given a splendid testimonial to in the first edition of the paragraph on "Machine-made bricks." He then went on to say that Flettons would stand the weather, were not vitrified, and would stand fire.

In reply to these objections, we may say that we are the oldest firm of manufacturers at Fletton, and have sold many millions of bricks for important railway and engineering works, and have never heard of our bricks crumbling to pieces in the weather, and shall be glad if your correspondent can point out a building in which our bricks have been used where weathering has taken place.

Your correspondent is also wrong when he says that our bricks are not fused. If he will take trouble to break one he will see that they are splendidly fused, and are as hard and well-burned as Staffordshire ware, and if he will sound them he will find that they will ring like iron.

We shall be glad, also, if he will point out a brick which will not stand fire. We have had Fletton used in our kilns for many years, and they have been subjected to very severe tests, but are still of good condition.

We are of opinion that the Fletton brick will become more and more popular in London as great capabilities become more and more known. H. BRAY & CO.

SIR,—We cannot allow the letter signed "A Lover of a Good Brick" to remain unanswered. He says, up to a few years ago the number of stock brick, was the only one used in London, this he is mistaken, as our firm have been sending many millions of gault bricks every year to London for more than forty years.

2. That gault bricks will not stand fire. We have been repeatedly complimented on the excellent quality of our gault bricks have stood the fire—we have ourselves used many thousands in our kiln arches which have been in constant fire for more than 20 years before being renewed, and they stood the well.

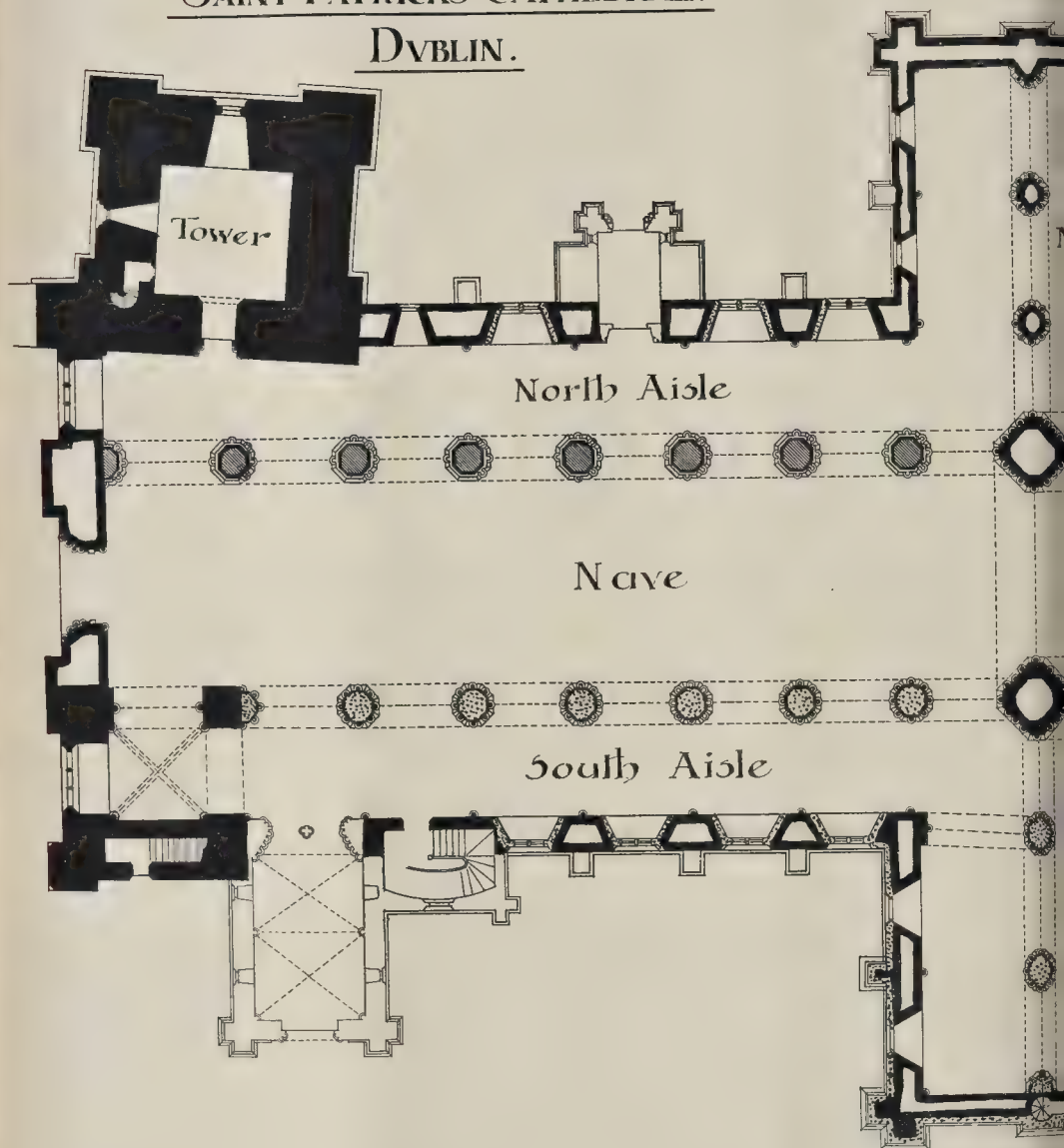
3. From carefully conducted experiments it





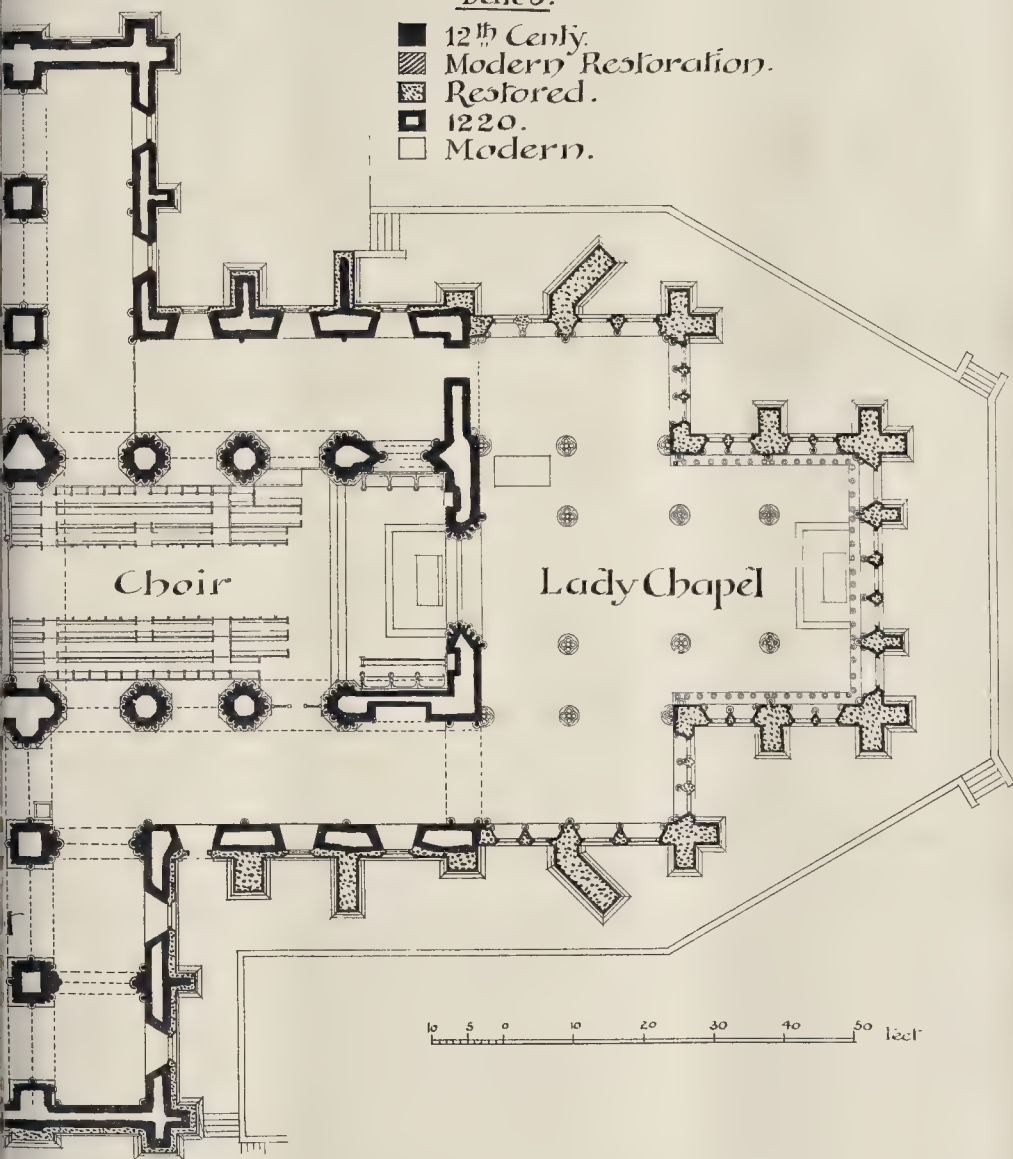
SAINT PATRICK'S CATHEDRAL.

DUBLIN.



Dates.

- 12<sup>th</sup> Centy.
- ▨ Modern Restoration.
- ▩ Restored.
- ◼ 1220.
- Modern.







constantly proved that a gault brick will stand  
ch greater pressure than a stock.

That gault bricks are liable to fly—this is  
due to the limestone, from which the Arlesey  
is quite free.

THE ARLESEY BRICK COMPANY.

## HYGIENIC FIREPROOF BLOCK PARTITION.

—In your notice of our exhibit of the above  
Building Trades Exhibition in your issue of  
h 24, you mention that, while we claim as one  
advantages that there is no open space, as in  
partitions, for the accumulation of dust and  
it, we seem to forget the open spaces left by our  
tubular passages, which, like the space in an  
ary partition, can never be got at or inspected  
y way. We would respectfully beg to point  
to you the absolute impossibility of these  
acting as a receptacle for dirt, &c., and this  
the fact that the end blocks are placed in  
contact with the side walls at right angles to  
the partition is built, so that no entrance  
over is left to these spaces. Consequently no  
or debris can become deposited there. We  
manufacture the blocks without any hollows.  
are about 10 per cent. heavier, which is not  
ous item when you consider that the tubular  
only weighs 66 lb. to the square yard. Apolo-  
gizing for troubling you.

THE FIREPROOF CONSTRUCTION CO.

We admitted that these open spaces were less  
to intrusion of foreign matter than most others.  
one never quite knows what may go on in open  
which are entirely inaccessible for examina-  
[En.]

## DECORATION OF THE CONSER- VATIVE CLUB, ST. JAMES'S STREET.

—Without desiring in the least to question  
criticism of the decorations recently executed  
Conservative Club, St. James's-street, permit  
me to point out that when the upper part of the  
Hall was decorated in 1845 by Mr. Sang,  
the very eminent architects who designed the  
ing, the lower hall, ceiling, and pendentives  
also decorated in the same manner and by  
the decorator.

had been very badly repaired and was much  
condition, and what really has been done is  
ore the decoration just as it was originally;  
original drawings still exist, and re in Mr.  
possession.

white marble may be thought to have spoilt  
ork "of the two architects since deceased,"  
w far a restoration of what they authorised in  
instance does so is open to argument.

perhaps, needless to add that the marble  
ly used as a ground to decorate, because it  
ere, and it was cheaper and more convenient  
his than to pull it down and re-plaster the  
eneath it.

A MEMBER OF THE CLUB.  
lose my name, but not for publication.

RCH OF ST. JOHN, DAMASCUS.—We are  
lled, for want of space, to postpone till next  
a letter from Mr. Lethaby, in reply to the  
ication of Mr. Spiers in our last.

## the Student's Column.

## STRUCTURE AND PHYSICAL PROPERTIES OF BUILDING STONES.—XIV.

THE PURBECK DISTRICT (continued).

URNING to the other series of quarries  
in the "Isle"—the Purbeck-Portland  
group—we must say that we were  
hat disappointed during our visit, to  
few of the workings actively engaged.  
k-Portland stone is well-known to archi-  
name, and has come to be regarded of  
table importance as a building material,  
doubt very much whether many architects  
it other than by name. It is not that  
is in any way inferior, quite the  
—and we are at a loss to understand why  
not more often used.

ing from Swanage (see map in last article,  
and walking due south we arrive at the  
Whim quarries (No. 3 on the map), old  
ings continued underground into the hill for  
distance, from which stone has not been  
for very many years. Ascending the hill  
cing the coastguard footpath we find the  
ing Ledge quarry (No. 4 on map) which,  
ners about to be described, is admirably  
so far as water-carriage is concerned, as  
cks may be dropped into lighters along-  
calm weather. The stone is light grey,  
white, in tint, exceedingly fine grained  
obtained from two beds in the open. Its  
re is illustrated by the following diagram  
b) from which it will be observed that the

material consists essentially of small, altered  
oolitic granules, adhering to each other, or  
bound together with shell fragments by an  
abundant calcitic matrix, and partly also by  
infilling silica. Free spaces exist here and there,  
and quartz fragments are rare. The durability  
of the stone rests largely with the matrix which  
is well crystallised and of promising character,  
whilst the oolitic granules are fairly hard.

FIG. 17.

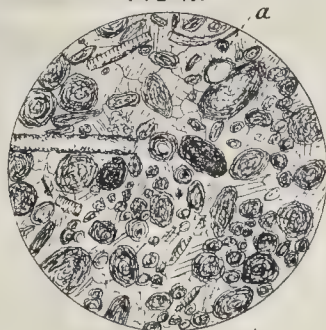


FIG. 17.—Micro-structure of Purbeck-Portland  
Stone (Dancing Ledge Quarry).

a = Quartz grain.

Regaining the top of the cliff, and passing by  
two quarries not being worked at the time of our  
visit (Nos. 5 and 6 on map), and known as Hled-  
borough and Gallery respectively, we come to a  
large opening known as Seacombe quarry (No. 7  
on map). This has provided material for the  
construction of several edifices in the vicinity,  
and has been sent also to many parts of the  
country: it was opened more than a hundred  
years since. The workings are partly in the open  
and partly underground, as shown in the following  
section (fig. 18). From this it will be gleaned

thickness of the freestone bed is worthy of special  
mention; vertical joints were very far apart, so  
that the stone has to be cut *in situ*, and there is  
very little to assist the quarryman in his work.  
The following is a diagram showing its micro-  
structure (fig. 19); the sample from which the  
section was cut, was taken from near the top of  
the bed. It will be seen that small oolitic  
granules much obliterated by secondary alteration,

FIG. 19.



FIG. 19.—Micro-structure of Purbeck-Portland  
Stone (Sea on the Quarry—"Freestone" Bed).

a = Quartz grains.

and minute fragments of shells, are bound  
together, partly by adhesion to each other, and  
partly by a firm calcitic matrix which shows the  
characteristic cleavage lines. A number of free  
or open spaces exist, and quartz sand-grains (a)  
are tolerably abundant, by which it may be easily  
distinguished from the Dancing Ledge stone.  
A chemical analysis would indicate a rather high  
percentage of silica, but, as we see, it lends no  
aid to the preservation of the material. The  
oolitic granules are very hard and slightly larger

FIG. 18.

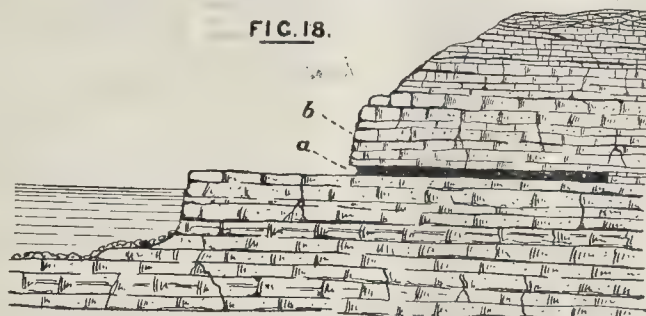


FIG. 18.—Section through Seacombe Quarry—Purbeck.

a = Underground gallery. b = Worked open face.

that the stone, whether obtained in the gallery or  
from the open face, is brought and masoned on  
the platform, and then despatched either by being  
loaded in vessels alongside, or by road, but the  
latter mode of conveyance is one of some diffi-  
culty by reason of the steep gradients leading  
inland. Going underground, we notice that the  
section at the end of the gallery gives two beds—

(1) "Cap," 4 ft. 6 in. in thickness, blasted with  
rock-powder, and used for sea-walls, &c.; (2)  
"Freestone" bed, yellowish, very fine-grained,  
8 ft. in thickness, never blasted. The enormous  
than those from Dancing Ledge, whilst the matrix  
is less abundant.

The stone worked at a higher level outside (b,  
fig. 18) is of a different nature, and known as  
"Pond" freestone. It occurs at the base of a  
5 ft.-6 ft. bed, from which it is cleaved, varying  
from 1 ft.-1 ft. 6 in. in thickness. In tint it is  
whitish grey, is exceedingly fine grained, very  
uniform, no real structure being apparent except  
under the microscope. On examination with the  
latter its oolitic granules are seen to be much  
more altered than in the freestone underground,

## Experiments on Purbeck and Purbeck-Portland Stones.

Quarry No. on Map (fig. 14) .....	Purbeck Stone.			Purbeck-Portland Stone.		
	1. Freestone.	1. "Thorn-back."	2. Freestone.	4. Freestone.	7. Freestone.	7. "Pond."
Specific gravity .....	2'45	2'70	2'28	2'41	2'34	2'30
" " of particles .....	2'64	2'71	2'56	2'08	2'69	2'62
Absorption of water .....						
per cent. in 1 second .....	21	200	70	76	1'21	1'40
" " in 1 minute .....	55	19	1'64	1'91	2'91	2'53
" " in 30 minutes .....	1'75	19	3'76	3'83	5'10	4'50
" " in 1 day .....	2'41	19	4'00	4'02	5'35	4'78
" " in 1 week .....	2'85	19	4'70	4'21	5'59	5'35



and their boundary lines are for the most part very ill-defined; at the same time a number of fresher-looking granules are distributed throughout and form rather a distinctive feature. Shell fragments are exceedingly small, and not very abundant, whilst quartz grains are fairly common. It may be distinguished from the true Seacombe stone (fig. 19) by its granular matrix, relative abundance of exceedingly minute fragments, and the comparative absence of free spaces.

Farther along on the coast, and nearer St. Alban's Head are Halswell and Windspit quarries (Nos. 8 and 9 on map), large openings but not exploited at the time of our visit, though stone had evidently been recently drawn. Inland is a quarry called "London Doors," used, we were informed, chiefly for estate purposes; it need not be further referred to.

The foregoing are the results of our experiments on samples obtained from various quarries alluded to.

The above results are highly instructive. They indicate that when the stone is fairly porous complete saturation is almost arrived at in less than half an hour; in other words, the stones absorbed nearly as much in thirty minutes as they did after being immersed in water for one week. If we take the Purbeck-Portland stones (Nos. 4 and 7), we arrive at the startling conclusion that they absorbed about one-half their full capacity in one minute. On the other hand, the less porous Purbeck freestones (Nos. 1 and 2) required a longer period of time for saturation. The results seem to point, also, to the conclusion that the stones absorb almost as much in a day as they will in a week.

We are not aware that anyone has previously made any "time"-absorption experiments of the kind now given. The subject is of paramount importance in regard to dry walls and kindred matters, as explained in a former article.\*

#### GENERAL BUILDING NEWS.

**NEW BANK PREMISES AT BRIDGNORTH.**—New premises for the Salop Old Bank are to be erected in the High-street, Bridgnorth. Mr. A. E. Lloyd Oswell is the architect, and Mr. William Bate the contractor.

**RESTORATION OF HIMLEY PARISH CHURCH, STAFFORDSHIRE.**—On the 29th ult. the reopening of St. Michael's and All Angels, Himley, took place after renovation. The work that has been carried out consists of the removal of the old pews and the substitution of pitch-pine seats. The old oak screen has been moved and altered so as to form a chancel in which new pitch-pine choir stalls and desks for the clergy have been placed. The floor of the small recess which is used as a sanctuary has been raised three steps. The old oak seating has been used as panelling round the walls of the church and chancel. The windows have been reglazed with cathedral tinted glass, and a new wood block floor has been provided under the seats and the passages repaved with small red tiles. The interior of the church has been re-coloured throughout. The work has been carried out by Mr. Smith, builder, of Broseley, under the direction of Mr. T. H. Fleeming, architect, of Wolverhampton.

**INFECTIOUS DISEASES HOSPITAL, STRATFORD-ON-AVON.**—On the 31st ult. the foundation-stones were laid of the Joint Infectious Diseases Hospital, about to be erected at Stratford-on-Avon at the expense of the Urban and Rural Sanitary Authorities. The hospital is to be erected on a site belonging to the Corporation and situated off the Birmingham-road. The plans were prepared by the Borough Surveyor (Mr. A. H. Campbell). There will be five blocks, including the administrative portion, all detached. The wards are on the pavilion system, and are designed with a view to enlargement if necessary. The administrative block provides accommodation for the matron and staff of nurses. The disinfecting chamber will be furnished with a Washington Lyon steam disinfecter. The buildings will all be of brick, with stone dressings, and their erection has been entrusted to Mr. G. Whateley, a local tradesman. The building has accommodation for twenty beds. The estimated cost, including the furnishing, building, and draining, is £5,872.

**CORN EXCHANGE, PLYMOUTH.**—On the 29th ult. a building to be devoted to the purpose of a Corn Exchange, and forming part of the reconstructed Plymouth market, was opened by the Mayor, Mr. W. Law. The buildings, of which the new Exchange forms a part, have been erected from designs by and under the superintendence of Messrs. King & Lister, architects, Plymouth, and Mr. S. Roberts, of Mount Plymouth, was the contractor. Mr. E. Stanbury was clerk of the works. The block occupies a site at the junction of East-street with Market-place, the entrance to the market having pillars of Devonshire marble. The Exchange itself is situated on the first floor of the building, having a floor area of about 4,000 superficial feet and a height of 28 ft. to the beams carrying the roof and lantern lights (five in number). It

is approached by two staircases from entrances in East-street and Market-place, with lavatory accommodation in each; also telephone-room and inquiry clerk's office. Ante and committee-rooms are being erected adjoining the principal staircase in Market-place. Separate stands, made of teak, for the corn merchants—twenty-seven in number—have been arranged around the walls of the chamber, with seats, lockers, &c. Each stand is divided by a movable screen from its neighbour. The tables and screens may, when necessary, be entirely removed, leaving the chamber free for other purposes.

**CHURCH, KILBOWIE, DUMFRIES.**—A new U.P. Church is in course of erection at Radnor Park, Kilbowie. Messrs. Malcolm Stark & Rowntree, of Glasgow, are the architects for the building, which will accommodate 500 people, and will have hall and vestry attached. The new church is planned to accommodate in area 300 persons, and in gallery 200. The entrance, which has a frontage to Skypers-road, is approached by ten flights of steps, and opens into a vestibule, from which staircases lead to the galleries above. Behind and connected with the church is a hall capable of seating 150 persons. The church is being built of red Devon Valley stone, with Auchenlee stone facings. The cost will exceed 2,000.

**PROPOSED EXTENSION OF THE EDINBURGH LADIES' COLLEGE.**—Early in some time past a want of adequate refectory and recreation accommodation has made itself felt at the Edinburgh Ladies' College, Queen-street, and the Governors have under consideration a scheme for extending the institution. The proposal embodied in plans which have been prepared by Messrs. M'Gibbon & Ross, architects, is to add two stories to that portion of the College buildings which abuts on Vauxhall Water Bill, and to set apart the lower of these as a luncheon-room, and the upper as a play-room. Both rooms will measure 91 ft. by 25 ft., and the upper or recreation room will be finished with an open timber roof 21 ft. high, and be lighted from the top as well as from the side. Precautions will be taken to prevent any noise from the new rooms interfering with the school going on in the apartments below; the new floors will be double, and finished with wood-block flooring having cement beneath. It is proposed to connect the new department with the existing buildings in Queen-street by means of a covered bridge or gangway, which will be carried over those lower-roofed portions of the College which used to be known as the Hopetoun Rooms. In order to secure as much light as possible, all the back buildings will be treated on the outside with white enamelled brick, and new roofs, consisting entirely of glass, will be put on the large sewing and singing rooms. The cost of the extensions is estimated at about 4,500.

**COURT HOUSE, MAXWELLTOWN, KIRKCUDBRIGHT.**—A new court-house has just been erected at Maxwelltown. It is situated in Terregles-street, and includes besides court-room, sheriff's private room, rooms for chief-constable, inspector, and witnesses, a police office, a store room, four cells, five dwelling-houses for married members of the force, and accommodation for four single men. Mr. Crombie was the architect, and the cost exceeds 4,000.

**SCHOOL, CALDERBROUGH, CALDERBROUGH.**—On the 25th ult. the new school erected at Calderbrough was opened by the Bishop of Carlisle. Messrs. Pickering & Crompton, of Whitehaven, were the architects.

#### SANITARY AND ENGINEERING NEWS.

**PROGRESS OF THE HAYMARKET TUNNEL, EDINBURGH.**—An important part of the extensive scheme now in progress for improving the Waverley Station and its approaches is, says the *Scottishman*, the construction of a new tunnel to carry a double line of rails between the west-end of Princes-street Gardens and the Haymarket. It, in point of fact, has been laid down parallel with the existing tunnel, from the south side of which it is only separated by an average distance of 20 ft. It is 1,012 yards in length, 18 ft. 6 in. in height from the rail level to its inner crown; it has a diameter of 27 ft. The tunnel, which runs at an average depth of about 20 ft. below the street level, is constructed of concentric rings of brick, the number running from four at the ends where there is no great weight upon it, to six, and even to eight, in the centre, where the pressure from houses is great. These brick rings are firmly cemented together, and to make the tunnel watertight, holes are left in the roof at certain distances, and through these cement grout is forced all round the outside of the brickwork at a pressure of 68 lbs. to the square inch. At certain points, also, where the tunnel has to carry a heavy weight, the solid oak beams with which the roof was timbered before the brickwork was built have been left in and bricked round so as to strengthen the tunnel overhead. There are manholes at a distance of 50 ft. on each side of the tunnel, so arranged as to give an alternate manhole at every 25 ft. Three of the heaviest buildings the tunnel passed through were St. Mark's Church, the south end of the Caledonian Station, and the Torphichen-street Police Station. The most of the property likely to be affected by the tunnelling operations was purchased beforehand by the railway company. The damage done to the buildings, however, along the route is very slight.

The tunnel itself, for the most part, is well founded on rock. A remarkable diversity of material was met in making the tunnel, which was mined in the ordinary way, and not—as those at the Mound—piled on the shield system. At the commencement of work in the centre of the tunnel there were originally two shafts, one at St. Cuthbert's-lane, and the other still in use at Torphichen-street. These it is proposed to convert, when the tunnel is finished, into ventilating shafts, and it is likely that the two tunnels will be connected at these points, so as to admit the old Haymarket tunnel enjoying the benefit of ventilation also. The new tunnel has a gradient of 1 in 610, falling towards the Waverley Station. The Haymarket end it comes out with a skew and an angle of 42, adapted to the line of the street above, and in the roof of the tunnel here may be put two sets of iron troughs which had to be put in to carry the water, gas, and sewage pipes of the street. The contractors for the tunnel are Messrs. Geo. Lawson & Son, Rutherglen, with Mr. Laing resident engineer. For the Railway Company Messrs. Carswell & Bell, engineers, are directed operations, with Mr. William Roger as local engineer.

**THE REBUILDING OF THE NORTH BRIDGE, EDINBURGH.**—The Lord Provost's Committee of the Edinburgh Town Council had before them the 2nd inst. a communication from the solicitor of the North British Railway Company making certain modified proposals with respect to the rebuilding of the North Bridge. It is now announced that deadlock has been removed, and that the negotiations between the Corporation and the Railway Company, it is said, are not demanding many concessions as heretofore, and their completion of 30,000, is not to be encroached upon by any serious deductions. In their new plans the Company have set the hotel and other buildings much further back from the street than was stipulated, but the question of their height still remains to be decided.

**SEWAGEWORK AND VAUXHALL WATER BILL.**—On the 31st inst. the Southwark and Vauxhall Water Bill passed the examiners. It provides for an extension of the limits of supply, authorises the company to construct additional waterworks and to take further supply of water from the Thames, and to add additional capital (750,000), by the issue of debenture stock, subject to the auction clauses, and to other purposes.

#### FOREIGN AND COLONIAL.

**FRANCE.**—A monument in commemoration of the battle of Dijon in 1870 was inaugurated last Sunday at Talant. A fine-art exhibition is to be opened in Cahors on the 1st of June, and another on the same day at Cognac. It is announced that Government will shortly bring before the Chamber of Deputies a "projet de loi" proposing the reconstruction of the National School of Decorative Arts, the National School of Limoges, and the Department of Ponts et Chaussées has completed preparations for the construction of a bridge of monumental character over the Marne, intended to unite the towns of Champigny and Nogent-sur-Marne. The cost is estimated at 1,200,000 fr.

**M. Léon Baillie** has been appointed architect at Perpignan.

**A railway** is to be constructed from Chalons to Argonne. In the competition opened by the town of Remiremont for the construction of a series of public edifices, the first premium has been awarded to M. Monginot, architect, of Epinal, and M. Hindermeyer, architect of Remiremont. Medals have been awarded to MM. Humbert Hindermeyer. The death is announced of Ernest Lavalard, landscape painter and collector of ancient pictures. He has left 300 pictures to the museum at Amiens.

**The death** is announced of M. Rattier, architect to the Government of Algiers and a chevalier of the legion of honour.

**The jury** in the competition opened by Aurillac for the building or restoring of public edifices have given the first premium to Grandin, of Aurillac, both for the restoration of the Hôtel de Ville and for the building of various schools. The second premium has been awarded to M. Bourgeois, architect of Poissy. Third premiums were given to Montanari, Morin-Goustiaux, Conin, Humbert, and Chevalier.

**Some important works** shortly to be taken in hand for the enlargement of the Hôpital St. Louis at Paris, are believed that the interdiction against building of the military zone around Paris is to be removed, will give scope for further development of a deal of land in the outskirts, and it will probably be a first step towards the demolition of the fortifications.

**The jury** of the competition for the extension of the Railway to Versailles.—A monument General Faidherbe is to be erected at Lille, by public subscription.—It is decided that the exhibition of the works of Carpeaux at the École des Beaux-Arts is to be from May 19 to June 1.

**An art exhibition** is to be held in Tunis, to include pictures, sculpture, tapestry, &c.—The jury of the competition for the extension of decorative panels in the theatre of Montpellier has decided to distribute the execution of panels among the following artists.—MM. E.

\* The Builder, p. 75, ante.



1. MARCH 30.—By *Merrins. Crank*: Nos. 656 and 660a, Holloway-rd., ut. 54 yrs. *g*; 451, r. 1151, 550l.—By *Field & Sons*: 246, 360, Brushfield-st., Spitalfields, f. r. 70l. 188, 597; 246, 248, 250, High-st., Borough, and 1 to 8, Nelson-pl., r. 397l. 45, r. 250l.; 238, 240, 242, High-st., f. r. 195l. 2, 240l.; 3, 7, Gloucester-rd., Camberwell, ut. 60 yrs. *g*, *g*. 94, 25, 50d.

[Contractions used in these Lists.—F.g. for freehold ground-rent; i.g. for leasehold ground-rent; i.g.r. for improved ground-rent; g. for ground-rent; r. for rent; f. for freehold; c. for copyhold; l. for leasehold; s.r. for estimated rental; p. for unexpired term; p.a. for per annum; yrs. for years; st. for street; rd. for road; sq. for square; pl. for place; ter. for terrace cres. for crescent; yd. for yard.]











**Particulars on Application: Chief Offices: Fitzroy Works, EUSTON ROAD, LONDON, N.W.**

## ILLUSTRATIONS.

Building for the American Surety Company, New York.—Mr. Bruce Price, Architect .....	Double-Page Ink-Photo.
St. Marylebone General Dispensary, 77, Welbeck-street.—Mr. Beresford Pite, A.R.I.B.A., Architect .....	Single-Page Ink-Photo.
Metropolitan Life Assurance Offices, Moorgate-street, E.C.—Messrs. Aston Webb and E. Ingress Bell, Architects .....	Single-Page Ink-Photo.
Interior, S. Petronio, Bologna.—Drawn by Mr. F. W. Bedford, A.R.I.B.A. ....	Single-Page Ink-Photo.
Palazzo della Casa, Genoa.—Drawn by Mr. T. Rogers Kitchell, A.R.I.B.A. ....	Single-Page Ink-Photo.
Hyde Park Mansions.—Mr. F. E. Eales, F.R.I.B.A., Architect .....	Double-Page Photo-Litho.

## Blocks in Text.

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### To Advertisers and Patentees.

**S**OME little time since a pretty trenchant correspondence appeared in the *Times* in regard to the great and, it was asserted, increasing prevalence in newspapers and reviews, and more especially in publications devoted to the interests of special professions or trades, of a more or less organised system of giving, in the editorial portion of a paper, favourable notices—"puffs," they are called by the more profane—of materials or inventions, in exchange for an expenditure of money in the advertising columns of the journal. The natural contempt and indignation expressed by some of the *Times* correspondents in regard to such a system might have been a useful lesson to a good many people who seem to fancy that this is only the legitimate way of the world—of the journalistic world at all events. Unfortunately those who most need enlightenment on such a point were perhaps among the last who were likely to see and read the correspondence referred to. Having, however, only too good reason to know that this curious idea as to the principles on which journals may be conducted is a very wide-spread one among trading firms, it may be as well if we endeavour to put the matter once for all in a clear light in our own columns, and to explain generally what we have endeavoured to make plain to not a few correspondents privately.

We have then, constant epistolary evidence of the fact that a considerable number of persons engaged in the manufacture or sale of materials connected with building are under the full impression that the fact of being advertisers in a journal gives them a direct claim for favourable notice of their goods in that journal. In some cases letters making this claim are expressed in so insolent and high-handed a style as to be quite inexplicable except on the supposition that the writers really imagine that in paying money to the publisher for space in the advertisement columns they have in effect bought the editor, and that he

is not performing his part of the contract. During the recent Building Exhibition we received several letters from exhibitors who, in a like spirit, seemed to suppose that the duty and general practice of the editor or his representative was to visit such an exhibition with a list of the firms advertising in his paper, and pick out their works from the rest for recommendation.

There is something so preposterous in this idea of the function of a paper that it would be merely ridiculous if it were not so immoral. For consider what it really means. It means that a paper is to be an elaborate arrangement between advertisers and editor to gull the public. The readers of a paper which is concerned with a special class of subject are supposed to read it in order to get reliable information on the subjects in which they are interested. But on the principle which a considerable number of persons seem to regard as the natural and recognised method of conducting a paper, the publication would become merely an organ for recommending to the public—that portion of the public which are its usual readers—not what it is for their interest to know, but what it is for the pecuniary interest of the proprietors of the paper to recommend to them. It would seem that the mere statement of such a position ought to be enough to show the absurdity of it. But as we are addressing ourselves to those whose logical perception on these matters is evidently rather at fault, let us state clearly the principle on which every honourable and respectable journal is and must be conducted. It is simply this: the clients of the editor are his reading public, and his aim is to render his paper as useful and interesting to them as he can, by giving all the information that he can, and by taking every pains that it shall be correct and reliable. If he succeeds in doing this, and thereby securing a certain position and circulation, the advertisement pages of the paper become *pro tanto* a desirable means, to those who deal commercially in what the public wants, for making known what they have to offer, and putting their claims in any way that they may think most likely to secure attention. For the space to do this they pay money to the publisher, who represents the commercial interests of the proprietors of the journal; and in the long run the money obtained from advertisers is what forms the

commercial backbone of the paper; and it is the one-sided perception of this fact that no doubt leads a number of advertisers to imagine that on that account they have a special claim on the good offices of the editor. The other side of the matter, which many of them obviously do not see, is, that the value of the advertisements is in direct ratio to the editorial status and ability of the paper, upon which depends the quantity and quality of its circulation; the quality ruling higher than the quantity, in commercial value. The *Times*, for instance, commands, we believe, higher terms for its advertisements than any other of our daily papers, though it is well known that its numerical circulation is lower than that of at least two other daily papers which might be named. It is the high character which the paper has always maintained, and the fact that it goes into the hands of the best class of readers, which give the value to its advertisements. And when advertisers ask an editor to go out of his way to praise their work, because they are advertisers, they are not only asking him to do what is immoral—since the public, who are his clients, look for the unbiased truth from him—but they are actually asking him to cut his and their own throats; to take away from his paper the very quality which gives it its value to the public, and which consequently gives commercial value to the very advertisements which they themselves have paid for. For a little time the trick may answer, no doubt; but it is soon found out. The public are not so blind and stupid that they cannot see through that kind of thing; as that very correspondence in the *Times* that we have referred to served to prove. Even the very style of expression of a favourable notice given "for a consideration" is unmistakable; "its speech bewrayeth it;" it is impossible in the nature of things for a man writing a panegyric on such terms to simulate the manner of an honest and discriminating critic. If we were given a printed slip of miscellaneous notices of inventions or materials, we will undertake to say that we could pick out, from their mere style and wording, those which were honestly written and those which were mere puffs written as part of a bargain.

The reason why some of our correspondents apparently cannot recognise the truth of this view of the matter is, we believe, to a great extent, what need be called by no



worse name than want of knowledge of the world. That people do find those who are ready to exchange notices for advertisements is obvious enough from the nature of some of the communications which reach us. This very week we received a letter bringing to our notice a small but useful invention (which is noticed in another column of this issue), accompanied by the words "I cannot back this up with an offer of an advertisement, so must leave it to your kindness." Could anything be more painfully indicative of the extent to which this kind of bargaining for press notice must be going on? If manufacturers and inventors who reason thus had a little wider acquaintance with journalism in its best aspects, they would not imagine that such give-and-take practices were really the rule, or fancy (as some of them evidently do) that we are quixotic and peculiar in our notions on such subjects. If they look to some of the leading literary journals of the day, for instance, which deal with wider matters than those relating to a single profession and its attendant trades, they would find that the position we have laid down here is only the generally-recognised one. Take, for instance, such papers as the *Athenaeum* and the *Saturday Review*, which derive the bulk of their income from the advertisements of publishers: they will find on one page the advertisements of a large publisher, on another page a bitter and cutting review of one of his publications—and the literary critic of the day, it may be added, wields the tomahawk in a more merciless manner than any other class of critic, on the whole. And we should like to see what sort of reply a publisher would get from the editor of either of those journals (and others we might name), if he threatened to withdraw his advertisements unless his publications were more favourably reviewed!

Another minor matter in which our trading correspondents are much at sea, is in their apparent inability to understand the distinction between the functions of the editor and the publisher. The editor of this journal constantly receives letters asking him for the terms for advertisements, of which he knows nothing; and this in spite of a "standing order" which has appeared in our columns, under the head of "Notices to Correspondents," for at least a quarter of a century; and, correlatively with this kind of application, comes the complaint, "We are surprised that you have not noticed our patent something-or-other, as we are customers of yours." They are *not* customers of the editor's, they are customers of the publisher's. The customers of the editor, as already pointed out, are his reading public. The business of the editor is to make the paper as acceptable and useful as he can to his readers; the business of the publisher is, on the strength of the editorial character of the paper, to make the best sale of it that he can, and do the best business that he can with advertisers. The two departments are totally unconnected. The editor of this journal knows nothing about the advertisers, except in the same way that any other member of the architectural profession does, viz.: when he looks through the advertisements for some information he requires for himself. But it seems quite impossible to get some people to understand this.

If, however, we are compelled to point out clearly to advertisers that the fact of their occupying that position gives them no claim to editorial notice, we can at all events offer to those who are interested in building materials or inventions the compensating assurance that they are under no necessity of doing business with the publisher of this journal as advertisers in order to ensure attention from the editor. On this inverse position of the matter the patentees of new inventions especially seem in many cases to be much in want of enlightenment. Constantly we receive letters containing the particulars of a new patent

with a request that it may be noticed, followed by the "P.S.—We intend to advertise shortly"; or perhaps, if the writer is rather a greater adept in the art of putting things delicately, the question is added, as a kind of after-thought, "What are your terms for advertising?" In many cases one is obliged to quietly pass over this, as probably only arising from ignorance and not from any improper intention; his own or others' experience in other quarters having probably convinced the patentee that a *quid pro quo* will be expected for noticing his work. In a few cases where this kind of suggestion has been made in a more gross and offensive manner, by telling one in plain English that "if a favourable notice is given, business may be expected to follow" (!), we have felt obliged to tell the writers plainly that whatever we might under other circumstances have said in favour of their patent, as they have offered us a bribe for a favourable notice we are compelled to decline any reference to it whatever. This is, no doubt, a departure from the moment from the position that our readers are our clients and want all the information we can give them; if the thing in itself is a good one we ought under ordinary circumstances to bring it under their notice; but it is of the first importance that the honourable position of entire independence should be maintained, and should be *known* to be maintained; and to tell people who write in this manner that their offers have no effect on what we may say would be useless; people of that kind judge others by themselves, and the only way to convince them of their mistake is to shut the door in their faces. Nor, again, is it of any use for patentees or inventors to bring or send us introductions from some one supposed to be of weight or to have interest with the editor. Such introductions, in regard to matters of that kind, are merely waste paper; they have no effect whatever upon the mind of any editor who knows his business, and merely cause some extra and useless trouble to the introducer and the introduced. There is only one way of getting a favourable notice of any material or invention connected with building into these columns, and that is to convince us that it is a good thing; and nothing is necessary beyond that. Any invention or patent which on the face of it appears to be worth investigation (some do not) is sure of attention, and the humblest artisan who has invented anything that is of value would receive as much attention from us as the largest manufacturing firm in the kingdom. Indeed we may confess that the one other point (besides that referred to just now) on which we are disposed to quit sometimes our position of thinking only of what is of value to our readers, is that we do feel, in addition, a very considerable sympathy, on his own account, with any man who has made a really new and clever invention, and find a pleasure for its own sake in recommending his work, more particularly if he is in a position in which public recommendation in print may be of considerable value and assistance to him.

It is not till after a good many years' experience of the constant misapprehensions which exist among manufacturers and others connected with the building trades as to the true principles on which every honourable journal must be conducted, and the real position of the editor of a journal towards those who advertise in it, that we have thought it well to offer them publicly these few words in explanation of what many of them evidently do not understand. It may all be summed up in these two axioms; first, that it is the duty of the editor of a journal to give his readers "the truth, the whole truth, and nothing but the truth," as far as he can see it, independent of any commercial considerations, and that the very status of his paper depends upon that; and secondly, that money paid to the publisher of a journal for space in his advertising pages purchases the use of that space, and purchases nothing else, whatever. If those who have trade

relations with this paper will bear that in mind, we may hope that they will kindly refrain in future from addressing letters to its editor implying that his favourable opinion on their goods is a commodity that can be bought and paid for; an implication which in reality is nothing less than an insult, though we are sure that many who make it do not the least intend it in that light, and are only misled by a want of appreciation of the true theory and principles of journalism.

#### VANISHING LONDON.

**T**HE destruction of houses and other buildings which recall the old London of the English Renaissance has been going on, bit by bit, for many years past, under the influence of the "march of improvement," and it is to be feared is likely to go on, if anything, with increasing ruthlessness and rapidity. It is true that the interest in old buildings of this kind, and the perception of their picturesque character and historical value, has very much increased of late years, but the increase in activity in street improvements and rebuilding of old and dilapidated properties has gone on *pari passu*, and in a few years many old buildings which at present lend both picturesque character and historic suggestion to various London streets will probably have vanished. Though every effort should be made to preserve such structures as long as possible, it is self-evident that in any case they cannot last for ever, and in some cases at least it must be admitted that their removal in order to give place to structures better fitted to the practical requirements of the present could not reasonably be expected to be postponed. Against the useless and wanton destruction of any such monuments of the past we should be the first to protest; but the present life after all has its rights, and one cannot expect that people to whom house property of this kind has ceased to be of any practical value should preserve it at their own cost on account of its interest to other persons towards whom they are under no special obligation. If the State, or the municipal governing body, would expend some money from time to time in purchasing some of the most interesting of these ancient relics and preserving them as "monuments historiques," as is not unfrequently done in Paris, it would be another matter. But we are now before all things an economical people, and any proposal for such an expenditure of public money would probably raise an outcry among the ranks of the Philistines, and be put a stop to by the vote of a patriotic majority. It is no use shutting our eyes to this; modern Englishmen, for the most part, are made so, either by natural inheritance or by the demands of a rate-fearing constituency.

This being so, a volume of careful sketches of old London buildings, such as that brought out by Mr. Paul,\* has a value beyond mere artistic quality of the sketches, though this in itself is not inconsiderable. It is a record, carefully and faithfully made out, of buildings some of which have already disappeared since the sketches were made from which these drawings have been prepared, while others will too probably disappear very shortly. Mr. Paul's drawings, though they may be regarded as a little dry in style, are essentially an architect's rather than a painter's delineations; that is to say, they are drawings in which the main object has been to record all the architectural details of the buildings clearly and faithfully, without omitting such effect of line shading as is necessary to give them a pictorial balance and completeness. Etchings showing the broad effect and general character of old buildings, such as Meryon made of portions of old Paris, have a higher value no doubt in another sense, but they are not such accurate records of the architectural facts. Mr. Paul's

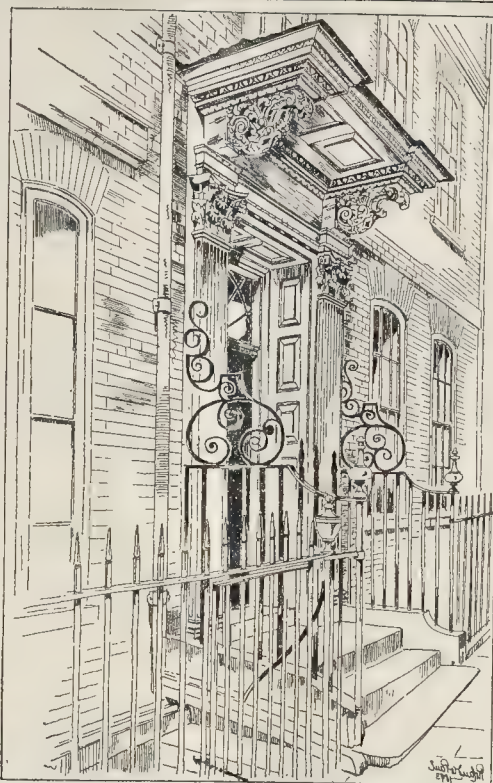
\* We may add that architects are just as great sinners in this respect as commercial firms. They almost invariably address letters about advertisements to "The Editor."

\* Vanishing London: A series of drawings illustrating some of the old houses, &c., in London and Westminster. By Roland W. Paul. Published by the author at Arundel-street, Strand, London. 1894.





Gate-piers, Lindsay House, Lincoln's Inn-fields.



Door-hood and iron-work, Buckingham-street.

sketches may be compared in this respect those careful and precise little water-drawings with which Shepherd, in the latter part of this century, did the same for the vanishing London of his own day and which are now entombed, as far as the general public are concerned, with the treasures of the Crace collection, in the offices of the print-room of the British Museum. It is one advantage of the method of drawing that no such lament need befall it. The drawing can be reproduced and multiplied in precise facsimile, and are thus available as private possessions; while the method of line-drawing, where architecture is concerned, gives facility for presenting, indeed the exact appearance to the eye of the old building, but the exact architectural details; and in this respect Mr. Paul has made a judicious use of it. The details of the mouldings, &c., are related with every carefulness and precision of line. In this respect the small collection of drawings will have a real value for the record of some of the old buildings of the present day, and will probably take its place as one of the standard records of old London, and be consulted and referred to as by future archaeologists.

There is not much of architectural elaboration in the buildings recorded in these sketches, except in some of the smaller bits of detail. A beautiful carved hood to a door in Grosvenor-road (plate iv.), still exists as one of the richest and most elaborate of the series. Another door-hood, less rich in detail, but exceedingly graceful and artistic in feeling, is that in Buckingham-street (plate viii.), of which we have reproduced a copy of slightly smaller size than that in the book. In some of the less elaborate examples we are struck with the

simplicity which is produced by very simple means, as with the group of houses from Buckingham-street (plate ix.), where the projecting bay in the centre house contrasts so effectively with the flat treatment of the two on each side of it, in which the windows are just emphasised by keystones, in one house quite plain (voussoir shaped) on the other adorned with masks, and in both cases connected architecturally with the string-courses above the windows. Simple as these details are, they impart an architectural style and refinement to the fronts. The plain brick mass of Garden House, Clement's Inn (plate xvi.), with its two strongly-marked cornices breaking it into three heights, and the slightly-projecting brick pilasters, is another pleasing and characteristic example. Lincoln's Inn Gate-way and part of Old Square (plates xx. and xxi.) produce effect by simple contrast of mass, and by the picturesque though perfectly unaffected treatment of the chimneys in the latter example. The introduction of the Classic order as a means of giving dignity to a plain street front is well illustrated in the old house in Great Queen-street, shown in plate xxvii.; and we have a somewhat similar example in the houses in Great St. Helens, Bishopsgate, where, by the way, the pilasters go straight up to the underside of the cornice and the usual machinery of architrave and frieze is entirely omitted, as in Mr. Belcher's building for the Chartered Accountants. A house in Austin Friars (plate xxxvii.) is an interesting example of the architectural expression given to an otherwise perfectly plain brick house by crowning it with a large modillion cornice. The Paul Pindar front, now in the South Kensington Museum, forms the subject of one of the illustrations. Among decorative details are those of a very fine ceiling from No. 17, Fleet-street, and also an exceedingly

elegant fire-place from the same house. The rich ceilings from Paul Pindar's house and from Crosby Hall are the subjects of other drawings. One of the most interesting of the smaller illustrations is that of the two noble gate-piers in front of Lindsay House in Lincoln's Inn-fields, described in Hatton's "New View of London, 1708" (as Mr. Wheatley tells us), as "a handsome building of the Ionic order, and strong beautiful court-gate, consisting of six fine spacious brick piers, with curious iron-work between them; and on the piers are placed very large and beautiful vases." The "curious iron work" is gone, but the "spacious piers" and their vases remain, telling of the former glories of Lincoln's Inn-fields as a place of aristocratic residence. We reproduce the drawing of these. With the schemes that are in the air for a wide north and south street through this part of London, it is possible that these relics will not be long left. A carefully-drawn view of Middle Temple-lane, of which we also give a reproduction (see p. 284), forms one of the most interesting of the plates; and perhaps the very best, in regard to picturesque effect, is the one of Barnard's Inn, with its effectively-treated windows and elegant little cupola on the ridge of the roof.

It would have been more convenient to the reader if the letterpress descriptions, which are printed separately at the beginning, had been arranged in the same numerical order as the plates; we do not quite see the reason for doing otherwise. We should not have omitted to mention that drawings of that particularly interesting building Emanuel Hospital, Westminster, now departed, form the subjects of two plates, showing portions of the exterior architecture; and the record of this building is made more complete by a small plan of the hospital appended to the letterpress.





Middle Temple Lane.—(See page 283.)

## NOTES.

**T**HE result of the debate on the London Water Bill is a forecast, we fear, of what we may expect as the result of a Water Commission which ignored the very point which ought to have been the leading subject of its inquiries—viz., the possibility of an ultimate ample water supply for London for an indefinite period, and confined itself to showing that the present unsatisfactory sources of supply would be sufficient for a period of forty-five years or so. The result of the Commission is, however, treated by the London water companies and their supporters as if the inquiry had been a general one into the possible sources of London water supply, and had established the fact that the present is the best supply possible; and now we shall have all the water companies applying for and probably obtaining powers to deplete the Thames further, on the ground that a Royal Commission has ruled that there is nothing better to be done. *Et après?* When the forty-five years have expired, what then? Forty-five years is much in the life of an individual, but it is little in the life of a city like London. The result of this partial and one-sided inquiry is that we are to go on getting water from an unsatisfactory and limited source for forty-five years, and at the end of that time the next generation of Londoners will have the main problem still to face, after large sums have been expended in provision which must in its nature be temporary, and after the Thames has been drained to the

last point that it will bear. It is really like lunacy.

**T**HE discussion as to which is the best brick for ordinary walling, which has been going on in our Correspondence columns, when cleared of *ex parte* statements and prejudice, and assisted by our own experience, points to the conclusion that in respect of durability there is little to choose, as far as time has at present shown, between stocks, Fletton, and gault bricks. In each case it is, of course, understood that care and skill are employed in the manufacture, for it is without question that many pressed bricks, and especially those used for facings, have failed by exposure to weather; gault bricks also, though perhaps less prominently, have been found wanting in durability, and especially in toughness. The appearance of bricks is so much a matter of taste that no universal consensus of opinion is at all probable. There are architects of our acquaintance who, so far from being displeased with the roughness and irregularity of the ordinary stock, appreciate the texture resulting therefrom so highly as to prefer "shippers" to the usual facing qualities.

**I**T appears that the commission of engineers in regard to the dam across the Nile have issued their report, two of them, Sir Benjamin Baker and Signor Torricelli, recommending the site below Philæ, Sir B. Baker undertaking to raise the island of Philæ bodily so that the

temples may be still above water without being pulled down and re-erected. Is the proposal made seriously? We confess we are somewhat surprised at seeing the name of Sir B. Baker appended to such an extraordinary and impracticable, not to say useless suggestion. M. Boulé, the French engineer joined in the commission, according to the *Pall Mall Gazette* has refused to discuss the Assouan site at all, in consequence of the involved destruction of Philæ. All honour to M. Boulé for showing so much more breadth of sympathy than we usually find among engineers. But then M. Boulé has a French public to appeal to on such a subject, which will understand and appreciate his feeling, and French engineers have a hereditary schooling as to the interest of archaeological remains, which our engineers unfortunately want.

**MISS HARRISON'S** paper at the Hellenic Society on Monday last, giving a *résumé* of Dr. Furtwängler's opinion on the sculpture and architecture of the Parthenon and the history of that building, and the Erechtheion, attracted an unusually large meeting, of whom the majority were ladies. Miss Harrison confined herself almost entirely to an exposition of Dr. Furtwängler's views, the substance of which has already appeared in our columns. M. A. L. Smith, of the British Museum, assailed Dr. Furtwängler's methods of investigation, and reasoning in a speech which even his opponents must have found very amusing, and in which there was a good deal of truth, at least in regard to the German method of reasoning out the most elaborate conclusions in archaeology from remarkably simple premisses. However, we are inclined to think that Dr. Furtwängler's reading of the pediment sculptures is one of the best that has been given; we only demur to it being regarded as conclusive. No such theory can well be conclusive at the present date; it is only a question of probabilities, though it will always remain a most interesting field for archaeological speculation and argument. The architectural side of the subject was hardly touched upon.

**THE "Société Archéologique Alexandrienne"** has just issued a letter asking for subscriptions to form a fund for the systematic excavation of certain portions of the ancient city of Alexandria. Tentative excavations have been already made by the Director of the Museum there, Dr. G. Boileau, and his report is appended to the appeal. We are also furnished with a map of reference, showing the portions already explored, and the proposed plan of campaign. There can be no question that Alexandria is a deserving site, if any, for the possibility of the finding of important MSS., and it might be rich in Hellenistic remains. Considerable efforts have been made locally, but it is now thought well to appeal to a wider public. A subscription of one Egyptian pound (*i.e.*, twenty-six francs) constitutes membership, and may be sent to Mr. J. Reeves, the President at Alexandria. If sufficient funds come in, it is proposed to proceed to work at once, and to issue a bulletin of the excavations.

**A** LETTER in the *Standard* from Mr. Perry a few days since drew attention in terms in which we entirely sympathise, to the extraordinary action of the South Kensington Museum authorities in practically destroying the splendid gallery of casts which had been formed adjoining the architectural court. The casts were there set all together in an admirable light, and in most suitable proximity to the architectural court. All this has now been altered, and the casts are arranged in a long and very badly-lighted gallery, where no one can see or study them properly, while their original room has been filled with textiles. A most ill-judged change could not have been imagined; it has robbed South Kensington



on of one of its greatest attractions. had for years wanted an adequate of casts in London; and having got it in a most satisfactory manner, the Museum authorities have deliberately one their own work, and placed the cation where half its value and effect are. We should like to know what is the al reason for this unfortunate pro- ng.

R. JOSHUA REYNOLDS'S summer villa on Richmond Hill is for sale. It is close to Nightingale-lane, and the "Star and Garter" Hotel, originally established in 1738, under an agreement between part of Dysart and one John Christopher. It is a piece of waste of Richmond Common. Reynolds employed Sir William Chambers as architect; the villa, though, has been added by additions since the painter's day. Negotiations for purchase were conducted by Thomas Hickey, whom Goldsmith com- parates in the "Retaliation," and perhaps the William Hickey who founded the will of 1727 the Richmond Almshouses were re-built at the Marsh-gate, on Marshgate-road, after Lewis Vulliamy's and designs, 1834. It was from this that Reynolds painted his picture of a view of the Thames valley looking over Sham Woods. In a house opposite Mrs. Fitzherbert, during the Regency, "Star and Garter," banqueting-house, were planned and designed by E. M. R.A., 1864-5

E. of the most serious results of the delay in the settlement of the railway controversy is the confusion which has with regard to the payment by traders in their ledger accounts with the railway companies. They have been advised by the House Association and others to nothing in advance of the old charges, many have acted upon this advice; some have gone beyond it, and declined to their accounts at all until readjusted. It again, appear to have withheld an- nual percentage of the total of their ts, leaving balances considerably in- of the amount representing increases es. Under ordinary circumstances, it is probable that the railway companies make short work of their refractory ers, and set the law in motion to payment of outstandings. But the magnitude of the undertaking strained them from taking any general in this direction, they have still found ticable in many instances to bring to bear upon defaulters by closing accounts. This has led to complaints made to the Board of Trade, and the at once requested the companies consider their action pending the of Parliament upon the Report Select Committee. The corre- nce which ensued has now been ed, and we notice that the Railway tion has made a very fair offer as increased rates. Sir Henry Oakley that they are prepared to submit to the Commissioners any advanced rate sonableness of which is questioned. will accept the decision of the Com- ers, and are prepared to agree to ings of this description being insti- and maintained without a liability for either side. Sir Courtenay Boyle pressed the satisfaction of the Board le at this announcement, but inti- at the same time, that the Board feel duty to proceed with their Bill, giving to the recommendations contained in ect Committee's Report. As to the of accounts, the Board could, of do no more than urge the Companies interfere with the freedom of trade; course in this respect will doubtless rated more by considerations of than by the representations of the

THE death of M. Paul Jablochhoff, a well-known name in the records of electric lighting, was reported by telegram from St. Petersburg on the 6th inst. M. Jablochhoff was an engineer in the Russian Army when in 1869 he became actively engaged in electrical matters through being called upon to carry out certain experiments for the Govern- ment. In 1875 he went to Paris and became connected with M. Breguet, and it was on March 23, 1876, that he obtained the first patent for the electric candle which has made his name so famous as an electric light engineer. During the following year a group of capitalists formed a syndicate with a capital of 500,000 francs, afterwards trans- formed into the "Société Générale d'Elec- tricité," with a capital of 20,000,000 francs, and furnished with these funds it was pos- sible for him to turn his inventions to com- mercial account. His candle was an attempt and, at the time, a successful attempt, to construct an arc lamp without any mechanism beyond the necessary switching arrangements. It is sometimes forgotten that Jablochhoff originally intended his candle to be used with direct current, but it was not found to be really successful until equal burning of the carbons was ensured by the use of alter- nators. If the candle did not fulfil a want it created a need, and the name of Jablochhoff will ever be associated with the great impulse given to arc lighting at the time. The candle proved such an important factor in the early history of the electric light industry that Jablochhoff's other work is frequently overlooked. His kaolin lamp, if not a suc- cessful one, was an early attempt at lighting by incandescence. In 1878 he took out the first patent for his alternator, and during the same year made various suggestions for the use of transformers in conjunction with his candles. He was the author of a good many inventions, but they are now mostly for- gotten. Unfortunately for himself Jablochhoff was a pioneer; he made a great name, but others have reaped the ultimate fruits of his labours.

IN Mr. Balfour's paper on "Evolution in Decorative Art," read before the Art Section of the Society of Arts, Tuesday, April 10, he described briefly some of the changes undergone by art designs, especially for decorative effect, and the causes which produced these changes. In introducing his subject he observed that archaeology alone was powerless to impart a thorough knowledge of the history and development of the art of design, and that, to supply the deficiency, the kindred science of anthro- pology was needed. Archaeological relics of the past were few, and, in many instances, nil; it was during the so-called "Cave Period" that man showed in the decoration of his implements skill of no mean order for the art of design; it was, therefore, the study of the living race that gave soul and life to the not all-sufficient science of archaeology. There were three stages in the development of any art: appreciative, adap- tive, creative. The first, the introductory, was a borrowing from Nature's suggestions, this was evinced by those early savages in the make of their implements which resembled some familiar object, an animal, or the human form. In the second stage these resemblances were added to by artificial means, as an eye at the right place to an animal's head; the carving of the mandrake root, thus increasing its resemblance to the human form. Out of this evolved the creative stage, when decorative effects and representations were produced at will. This was the foundation-stone of art industry and the development of the initiative faculty. In the representations of objects it was not unlikely that graphic art was a development of plastic art. One of the chief agents of variation in design was copying, copying from the original and from successive copies; here amusing instances were given and illustrated of differences between the original

and successive copies. Such changes were due to carelessness and inaccuracy—*uncon- scious variation*; or a desire to change and improve upon the design copied—*conscious variation*. Some ornamental designs were varied with a purpose, as in the case of Japanese family crests which assume new forms for new branches of families, at the same time retaining close likeness to the original. Mr. Balfour then passed on from those art designs which were representations of the human and animal form to ornamental designs. He pointed out how in examining these forms of decorations some clue might be obtained to the different stages of de- velopment through which the object had passed, as *e.g.*, the wooden dishes used by the natives of the Andaman Islands which resembled in shape the large shells formerly used as plates for food. A cer- tain species of outward ornamentation was that to be seen on some objects which being changed in structure had retained as ornament what had formerly been turned to use, as the figure of a lock- plate engraved upon the breech end of the gun, to be seen on the air-guns of an Austrian regiment, on the point where the actual plate would have been.

THE Exhibition of the New English Art Club (Dudley Gallery) contains less of mere eccentricity than last year, and includes some things that one can see with pleasure and interest. It would be difficult, from the exhibition taken generally, to evolve any decided theory as to the artistic principles professed by the club, except it were a general dislike to finishing anything, and even to this there are occasional excep- tions, as in the admirable portrait of the Rev. A. T. Lyttelton (72), by Mr. Furse, which occupies the central position at the top of the room. Some of the portraits, or "studies of a young lady," &c., are as ugly and repellant as usual, as if the object were to show how to make a recognisable likeness while depriving the face of every charm of natural modelling and natural colour. Mr. W. Sickert goes beyond even this in his daub entitled "The Sisters Lloyd" (54), a kind of thing which it is astonishing that the conductors of any exhibition can have the assurance to hang up seriously for the public to look at. Miss Beatrice Mal- colm's "Little Girl with a Macaw" (27), is a tolerably large work in which the bright colours of the macaw on one side and of the doll on the floor on the other side assert themselves in a striking manner out of a composition which is for the most part kept in low tones, but is very harmonious in effect. Mr. Edward Stott's "In the Moon- light" (50) has far too much colour for moon- light, as he would find if he had to paint that picture by the light of the moon and nothing else; Mr. Aumonier's "Moonlight Sketch" (52) is much nearer the mark. The "Marine" (58) by Mr. Wilson Steer, who sees the sky on a bright day cut into vertical strips of white, is about as natural as Mr. Holloway's "Yarmouth Roads" (70), where ridges and furrows of brown clay are offered us as water. Among the experiments that are of some interest is Mr. Cadby's "Portrait" (39) of a lady seated amid a considerable mass of accessories, which seems to have been painted with the object of giving the picture some of the effect of a metal inlay, a flat but sheeny surface. The effect is of course unpictorial, but yet not hard, and the means by which it is produced are not easy to unravel. In "The End of an Afternoon" (86) Mr. Francis Bate realises a beautiful effect of soft warm light on a landscape, and there is a true open-air light and colour in Mr. Charles's "Summer" (90). We may mention also "St. Ives Bay, Night-Trawlers," (47) by Mr. Lindner; "The Lagoon, Venice" (87) by the same artist; "Cows in an Orchard" (92), by Mr. Mark Fisher; "Study of a Head" (96) by Mr. Carter; "The Two Sisters" (97), a fine cat sketch by Mr. Tomson; "St. Ives Bay, Early Morning" (105), by Mr. Lindner; pencil "Sketches

Now known as Wick House. Confer Mr. E. B. "Historical Richmond," pp. 186-7 (1885).



and Studies" by Mr. E. Sullivan; "Finger-plate in Gesso and Coloured Lacquer" (23) by Mr. Silver, and "Fishing Boats, Venice" (4) by Mr. Brabazon, a good bit of colour without any definite form, which appears to be one of the things we are to seek after nowadays.

THE two pictures by F. Flameng to be seen at Messrs. Goupil's Gallery, of scenes in the early life of the First Consul, at Isola Bella and at the Château of Malmaison, are exceedingly interesting, not so much from the artistic as from the historical point of view; they are not works that anyone would care very much for in regard to mere pictorial power, but give the impression of being very real reproductions of the life of the time they represent and of the personalities of some celebrated characters in modern history in their younger days: Murat, Soult, Josephine, and others. This realistic interest is of course the scoff of the art-critic of the advanced school, but there are a good many people (not necessarily fools) to whom this use of painting to revive the life of the past is still not without its value. The collection of Dutch paintings in the same gallery includes good work and good names, but we did not find it very interesting as a whole. There are two or three good examples of the art of Sadée and Maris, and "Anemones," by Versler, a remarkable piece of colour. Messrs. Goupil have got their new gallery into a complete and effective state now.

THE small collection of pictures at present to be seen at Mr. Maclean's gallery in the Haymarket includes an admirable cattle piece by Mauve, of rather larger size than is usual with this artist, who (if this is a recent work) has given up what may be called his partial eccentricity of colour and composition while preserving all the finer qualities of his art. A picture by Jules Breton, "The Gleaner," is a good specimen of his lighter and more idyllic vein, appropriately hung under a picture, "Threshing Beans," in which Mr. Clausen has done his best to emulate Millet in the quality of energetic action and direct simplicity and realism of motive. There are one or two small but exceedingly fine examples of Mr. Henry Moore's seas; a good landscape by Mr. Wimperis, and other things of interest. Mr. Graham's large painting, "Scotch Coast Scene," is spoiled by the bad sea. Mr. Vastagh's life-size head of a lion is good, in a kind of realistic menagerie fashion.

#### ROYAL INSTITUTE OF BRITISH ARCHITECTS:

##### THE COUNCIL CHAMBER AND ITS ACCESSORIES.

AN ordinary meeting of this Institute was held on Monday evening last, at 9, Conduit-street, Mr. J. Macvicar Anderson (President) in the chair.

The minutes of the previous meeting having been read and confirmed,

Mr. Thomas Blashill read a paper on "The Council Chamber and its Accessories."

The offices in Spring-gardens now occupied by the London County Council were, he said, designed for the Metropolitan Board of Works by the late Mr. Marrable, who was the first Superintending Architect of Metropolitan Buildings and the Architect to the Board. They were opened in 1861. The number of members of the Board was at that time forty-eight; in the year 1885 that number was increased to sixty-one, and the Board-room was of ample capacity for the accommodation of the larger number. It was a rectangle on plan, measuring 50 ft. by 30 ft., and about 30 ft. in height. In respect of ventilation and acoustics, however, the room was extremely unsatisfactory. The heating-chamber, formed under the centre of the room, was fitted with hot-water pipes; fresh air was conducted into the chamber, and was supposed to find its way into the room through pedestals and upright tubes fixed against the walls. The tubes were generally kept shut. In warm and cold weather alike draughts were generated, of which members complained. When, in 1889, the London County Council was elected, its first meeting held in the old Board-room

showed the necessity for an enlarged chamber for the accommodation of its 137 members—nearly three times the number for which the room had been designed. He was instructed to undertake the task. The only practicable way of obtaining more space for the Council Chamber was to extend the old Board-room on the northern side; and the first question was as to the shape which it should take. He was, in the first instance, rather strongly urged to make the new chamber something of a rectangular shape, the seats and the back wall being laid out in a rather flat curve, as is usual in the pit of a theatre. But in a chamber so arranged, a member in one of the front rows would have his audience behind him, unless he should turn round and face them, while a speaker in any of the back rows would be unseen by his colleagues. Upon full consideration it seemed clear that the best form would be a chamber with a semi-circular end and a semi-circular arrangement of the seats, the whole of the seats being placed as near the walls as possible. This would leave a clear space in the centre of the chamber—the place from which no one could speak with comfort. Such an arrangement could be brought about by taking down the north wall of the old board-room and making the new wall semi-circular. This was made practicable by the use of a wrought-iron lattice girder of 50 ft. span to carry the heavy roof from which the supporting wall was to be removed. The only variety in the symmetrical shape of the chamber was necessitated by the requirement of a public gallery, and this was made to extend round and outside a portion of the new semi-circular wall. The architectural details of the building, as it now exists, grew entirely out of the original design of Mr. Marrable's board-room. The additional pilasters upon the walls, the columns carrying the roof at the public gallery, with all the architectural enrichments on walls and ceiling, were simple reproductions, or so arranged as to correspond with the old work. The columns and pilasters were of scagliola, covering cast-iron stanchions where necessary, and the old pilasters were painted to look like the new. The press gallery at the back of the chair seemed to require some special treatment, and in that case the Ionic style was used in the columns, instead of the Corinthian which had been adopted in the larger features of the chamber. He was rather anxious about the height of the room, for 30 ft. did not seem too much for the old board-room, which was going to be so greatly enlarged. By dropping the central portion of the floor, and placing the seats upon a rising slope, an additional height of 15 in. was gained in the centre. In the chamber every door had a check-spring fixed in the floor so that it could not be slammed. The parts of the floor most subject to wear were laid with Napier matting of a dead green colour made from jute. The floors between the seats were laid with a dull green druggut upon common grey felt—an idea which he got from the Union Society's rooms in Cambridge. Besides being comfortable, it was impossible to get any noise out of it. The woodwork of the seats likely to be struck by the feet was covered with ribbed vulcanised india-rubber. The stuffed leather work was brought right over the backs of the seats to avoid hard surfaces. The lower parts of the walls of the old board-room were covered for a height of about 8 ft. with heavy woollen hangings in the hope of deadening the sound. The long benches were divided by elbows measuring 2 ft. from centre to centre; the measurement from back to back was 4 ft. The long benches were so arranged as to contain at least three, and at most six, seats. Six should be the maximum. It allowed every member to find his seat without passing more than two other persons. The details of the tables were then described, and the arrangement of the chairman's desk and platform. As to acoustic qualities, ordinary conversation could be heard in the chamber over its whole extent. He could not speak quite as favourably about the ventilation. The old system of passing fresh air over a coil of pipes in a heating-chamber in the floor had been continued. There was a grating in the floor which could be kept open or shut, and there were upright tubes by the walls. He was not sure that these were of any use. Over the ceiling was an exhaust fan driven by hydraulic power that could be regulated. When going at its full speed the air entered the chamber too quickly, and, therefore, insufficiently warmed.

\* We may observe that the "special treatment" of the reporters' gallery does not include the practical desideratum of rendering it commodious and comfortable for the reporters, though this may have been intended. Great complaints are made about it in this respect.—Ed.

As a rule, the draught caused by one of the lights was sufficient to draw the air from the heating-chamber at a proper temperature, and cold weather the heating-apparatus was kept going during the greater part of the week, so that the chamber ought never to be quite cold, and he did not think there was much complaint on that head. But in warm weather, as in cold, there were certain members who complained of draughts; thought these were generally caused by currents of air falling down the cold walls. The surfs of such walls should be plastered with a material and finished with a rough surface, or finishings of smooth, hard cement were objectionable, as causing condensation and chilling that comes in contact with them. The chamber was lighted by three sunlights, which assisted in warming the air. There was, in addition, a complete system of electric lighting. The speaker concluded with some general remarks as to the arrangement of buildings of this class so as to fulfil their purposes most conveniently.

Mr. Charles Fowler suggested that Mr. Blashill should say what was the level of the new Council Chamber, and whether there was a story underneath which was lighted.

Mr. Blashill replied that the chamber was on the first floor, the room underneath was lighted by windows occupying the whole of the wall, and there was a room with glass walls lighted a portion of the room.

Mr. Wm. Woodward said he had not gathered what was the form of the room, and the material of which it was constructed.

Mr. Blashill said that the roof was constructed with a cove; where the old wall had been removed the roof was carried now on a 50-ft. girder, and another girder was about 16 ft. in the rear. The chamber was entirely lighted by those coved lights at the room, and a large amount of ventilation got from these.

Mr. Aston Webb, in moving a vote of thanks to Mr. Blashill for his paper, said that, although he had never built a council chamber, he had built several chambers used very much in the same way, and he ventured to think this was one of the most practical and useful papers he could be read to practising architects. He said that the present time was the time of and, therefore, chambers in which talk would take place were likely to be erected in increasing numbers. With regard to the acoustics of a building, his own experience was that it was not a good acoustic material with which to cover the walls, and he understood that Mr. Blashill was of the same opinion, because he appeared to have covered his walls with woollen material. He, the speaker, had wood panelling, which was an admirable material for covering the walls of a room in which music was to take place. It seemed to him that violin did in regard to the strings, for, giving any echo, it appeared to carry them well. He could not help thinking, while Mr. Blashill was speaking, how excellent a room hearing they were in at the present time, although many of the conditions seemed to be against it. The central dome, for instance, would fancy would give an echo, but he never noticed anything of the sort. He believed it was admitted by everyone that the requirements for a perfect acoustical room had not been formulated, and that architects were only, as it were, go by rule-of-thumb, and by their own experience. His experience was that a smooth plaster wall was a resonant medium to use. When building the courts at Birmingham they had many conferences with the Judges, and they were going to use the courts, and they all thought that one of the things which annoyed them more than anything else was the continual clicking and jarring of some of the swinging doors. He last found one door which was quieter than the others, and although that particular door was out to be the weakest in construction, and the least likely to last, they adopted it for themselves, using the stronger and heavier springs for the outer doors. Another point which must occur to everybody who had dealt with chambers of the kind, was the position of the Press. Mr. Blashill appeared to have pressed into a gallery behind the chairman, and did not seem to be quite sure whether the position was altogether satisfactory. He (the speaker) had on one or two occasions consulted the architect about the position in which they liked to be placed, and he had never heard them express other opinion than that a gallery was the unpleasant place in which to work. The opinion amongst reporters was that the right



the Press was between the speaker and the man, very much as the reporters were placed in the evening. In all the courts at Birmingham Press had been so placed, and he was glad that they were satisfied with the position. He might be the difficulty, which Mr. Blashill mentioned, of attempts to get at the Press members of the County Council, but otherwise the best position would be just below the platform, in front of the chairman. In covering the desk he had used very much the same material as Blashill—a dark green material, which wore and was absolutely quiet for the footstep. For ventilation, he had always endeavoured to have a room independently of the warmed fresh brought in. He had direct radiation in the room itself by means of hot water or steam radiators. Referring again to the acoustics, he thought the height had a good deal to do with it, and it was not well, as Mr. Blashill said, to have a chamber too high. Although it might be from an architectural point of view, from an actual point of view it should be kept lower than high.

J. M. Brydon seconded the vote of thanks, considered that the subject brought forward by Mr. Blashill was an eminently practical one, that many Municipal buildings were being built throughout the country. He had no doubt Mr. Blashill had been hampered to a great extent in carrying out the present County Council Chamber. The ordinary provincial Council Chamber was not so large as that of the London County Council. The great point in a Chamber was kind was that the members should hear each other, and the difficulty was to keep down the noise of the Chamber so that everyone could hear and see distinctly, and that it should have, at the same time, some sort of architectural effect, something, as it did, in a concrete form, the form of the Municipality of the time. There were two or three points, which had been brought forward that night, which were instructive, and as far as the size of the room. He had by experience in one Council-chamber that it must be kept as low as possible. The difficulty all along was to keep down the echo. The Council-chambers of certain provincial towns there was a good deal of coming and going, and putting the seats right up to the walls considered would be rather a mistake. He thought, therefore, that a passage should be left between the seating, so that all the members could go to their seats without crossing the room. Everything should be utilised which would tend to deaden the sound in the way of lighting, which he had adopted with some success, helping as it did to keep down the reverberation of sound. Sometimes a provincial Council-chamber was used for other purposes, meetings of the Council. It was one of a number of rooms, and when the Municipality gave a entertainment, it often happened that the room was made into a sort of reception-room or ballroom. The designer had, therefore, to think of being utilised for other purposes than that of a Council-chamber. Then, again, the room was usually part and parcel of a suite, and must be certain extent be treated architecturally, and that by cutting the walls up, and projections into the room, the echo was prevented, and the acoustics very much improved, and this was a means by which a certain amount of architectural effect could be gained. Meetings of a Council were public, and so a room had to be provided for the community. There were constantly coming and going, and he would be the last to say that the meetings should be held *in camera*, a large public room was not at all desirable. If two rows of seats were provided for the public it would be fully found sufficient, as it was only on special occasions that the gallery would be full, when the ventilation would be put to its best test. Again, in the case of the Press, a table placed at the side of the mayor and the members, between them and the speakers, to the right or left, had been found by experience to be an extremely convenient one, very much as the reporters were placed, as he had seen in Mr. Webb's Courts of Justice at Birmingham. He, the speaker, once designed a gallery, but he found the Press would not sit there, and rather came down to a table in the room. It was necessary also to have seats and benches in the body of the room for deputations, and often came. In the matter of seating, he thought with Mr. Blashill that the separate system, where every man had his own seat, was an unnecessary waste of space, and a bench holding from two to six people would probably be found the best plan, with a

desk in front of sufficient width to hold ordinary foolscap paper.

Mr. William White, F.S.A., agreed that the best position for the Press was, as Mr. Webb had said, immediately in front of the chairman, and between him and the audience. He could not help thinking that the matter of hearing depended very much more upon the proportions of the room than upon the material with which the walls or floor were covered. He had no doubt that plaster was objectionable, when there were very large plain surfaces to be covered with it, but he believed the proportions of the room had still more to do with this matter. He believed that similarity in the height and width of a room was the greatest obstruction, by way of echo, to the sound of a building; means, therefore, ought to be taken always to avoid those special proportions. He had made observations in various places, and he was most struck with the sound of two public rooms at Stockholm, the one being exceedingly good for sound, and the other excessively bad. The one that was bad for sound had nearly the same proportions for height and breadth. The worst place he had ever been in for sound was a school at Reading, some time ago, where there were two rooms of equal dimensions and equally bad for sound, being cubes of 25 ft. each. If it was desired to deaden the sound, a carpet or something of the sort on the floor was good, but if they had a room in which the proportions were favourable for sound, they could not have anything better than hard wood pavement or a concrete floor. He knew that many organ builders held that this was the best position for an organ.

Mr. Charles Fowler remarked that he had learned something practical the other day in the country in the matter of sound, and he was anxious to give his colleagues the benefit of it. In the case of a country church, which had been restored, seating from 300 to 400 people, amongst other improvements the whole of the seats were paved with wood blocks, but the rector informed him that he was astonished at the greater difficulty he had now in preaching than when he had the old boarded pews.

Mr. H. W. Barrows remarked that it had been incidentally mentioned that the London County Council chamber was lighted from the cove, and, therefore, practically from the top. A very large number of the provincial chambers were lighted in the same way, but others were lighted from the side. He would like to ask Mr. Blashill his opinion as to the best mode of lighting—whether he considered it better to light entirely from the top?

Mr. Woodward said that Mr. Brydon had referred to the use of columns for architectural effect. He apprehended that the position of those columns would be close to the wall, because nothing could be more fatal in a Council-chamber or any such hall, as ordinary columns.

Mr. Brydon: Of course, they were close to the wall.

Mr. Woodward said that Mr. Knightly, a Fellow of that Institute, had built in Langham Place certainly one of the finest halls in London, and perhaps in England. It would be well, therefore, if they could get Mr. Knightly to come and give them a paper dealing with the hall.

Mr. Hutton (Chairman of the London County Council) said there was no doubt that the exercise of Mr. Blashill's ingenuity had been limited to a large extent by the conditions of the case. The result, however, was that they were blest with a Council Chamber, where, if the members were moderately quiet, there was no difficulty in hearing what was said. He did not know if any more tangible compliment could be paid to Mr. Blashill than that expressed by the members of the Council on their return to Spring Gardens from the Guildhall, where they were accommodated during the re-building of the Council Chamber. Everyone then said what an immense improvement it was on the Guildhall Chamber, and that they could hear with much greater facility.

Professor Kerr asked Mr. Blashill how a deputation was received in the County Council Chamber?

Mr. Blashill replied that they were not received there at all. The practice was to receive deputations in committee.

Professor Kerr said that that emphasised what had been passing in his mind, viz., that this council chamber was a peculiar one, though it was admirably planned for the very purpose which Mr. Blashill had described, viz., that the discussions should be short and sharp, very much to the point, quite uninterrupted, and touching only upon that which had been exhausted elsewhere as

regards investigation. It struck him that in most council chambers where deputations from without had to be received, it would be important that the model of the House of Commons should be to some degree imitated, so that the public might have a right of access at one end of the chamber. With regard to the cutting up of the wall by architectural decorations, it was quite well understood that this was an excellent way of rendering a chamber better for hearing. With regard to lighting, ordinary windows in the wall were not to be thought of in a large chamber like this, and it seemed to him that the coved windows were the best. A lantern light in the middle was a bad plan for lighting such a chamber. He had in his mind a police-court, where nobody could hear what was going on except by special instinct, and where the magistrate was continually reprimanding people for the slightest sound they made. The reason was that the room was lit by a long square lantern, glazed all round, but it ought to have a vellarium underneath, as at the Albert Hall, to keep the sound down within hearing distance. He wondered if he would be out of order there in referring to the Law Courts, which were very unsatisfactory, both as regards lighting and hearing. In respects of hearing, it struck him that the reason was the extreme height. It was certainly not at all advisable to have a discussion chamber too high. With regard to their own room, which had been quoted continually as a model of acoustic excellence, the dome was created for the purpose of ventilation, but in that respect it had been rather a failure. If, however, it served the other good purpose of promoting the acoustic principles of the room, it was a compensation on the part of nature for which they ought to be thankful. With regard to Mr. Woodward's suggestion, he had no doubt that Mr. Knightly would be most willing to read a paper on the Queen's Hall.

The President said that the subject brought before them that evening was a very important one. County Councils were springing up all over the country and would require homes. It was, therefore, of the utmost advantage for them, as practising architects, to deal with the results of the experience of such a man as Mr. Blashill. So far as he could judge by the description given, the hall of the London County Council appeared to be a success in many, if not in all, respects. It was satisfactory to gather this opinion from what Mr. Blashill himself had stated, and it was still more satisfactory to be assured of the fact by the Chairman of the Council himself. The problem of accommodating a large number of people in one room, so that every one could see and hear distinctly, was a very difficult one. Many suggestions had been made by way of obviating this, but there was one which he would venture to suggest which had not been made, and it was that, in place of altering the rooms, they should reduce the number of the members. The question of acoustics was also a very important one, and had been touched on by several speakers. In his experience the worst room in London to speak in was the Egyptian Hall at the Mansion House, while the best hall, he believed, in London for acoustic purposes was the Queen's Hall in Langham-place. He had had occasion to gather some experience on the construction of this hall, and he had learned the principles on which it had been designed in regard to acoustics. Taking the plan of the hall, in place of being designed in circular form, the curves of the orchestra were reversed, or made aggressive and not receding, while instead of the cove in the ceiling being concave, it was curved in an opposite direction. That he believed to be the principle which had produced such successful results.

The vote of thanks was then put and carried by acclamation.

Mr. Blashill, in replying, said that it was true he intended to open the general question of council chambers, and he had hoped that something might be said upon matters with which he could not deal. Much had been said about the seating of the Press, and about their being placed on the floor of the chamber. This might do very well in smaller county chambers, where there were only two or three reporters, but it should be remembered that there were three dozen in Spring-gardens, which entailed a rather different arrangement. They had heard something about the proportions of a council chamber, but he had no hesitation in saying that he had never heard any one who could tell him, in feet, and if necessary in inches, what the proportions should be. With respect to sound, if there was complete silence and a well-arranged room, no one need speak more loudly than he was speaking at that moment. There were all kinds of fancies about



sound. In the case of the new Opera House at Vienna, where a couple of architects were employed, at the opening performance the Press and a certain portion of the public were unanimous in saying that, although the building was a fine one, the sound was bad; yet, after a few more performances, everyone came to the opinion that it was one of the best places for sound in Europe. With regard to lighting, he thought the cove-light was the best, while a large lantern-light was a great mistake and spoilt the sound. They had no trouble whatever with the doors. They used a quiet spring such as that of Adams or other makers, which allowed a door to close within a couple of inches, and then it took its time to finish the closing.

The President said he did not quite agree with the criticisms of Professor Kerr as to the ventilation of the room. Those who remembered the room as it was must in fairness concede that it was very much better than before, though without motive power for ventilation it was impossible to have a perfect system. He had to announce that the next meeting of the Institute would be held on April 23, when papers on "Furniture—Domestic and Ecclesiastical," would be read by Mr. John Belcher, Mr. C. F. A. Voysey, Mr. Aldam Heaton, and Mr. W. D. Caröe, under the management of the Art Standing Committee. The proceedings then terminated.

#### MAGAZINES AND REVIEWS.\*

*The Art Journal* gives an article by Mr. Pennell, "On the River," accompanied by sketches on the Thames (the tidal portion) in which the craft and the general effect are better treated than the architecture; Waterloo Bridge, for instance, is done great injustice to. Mr. J. M. O'Fallon contributes an article on "The Work of Birmingham Jewellers," a description of processes in which mechanical treatment seems to play a very large part, as indeed the writer implies. Mr. Lewis F. Day contributes a paper on "Early Italian Art" in reference to the recent exhibition at the New Gallery, and Professor Baldwin Brown a note on "A new piece of Scottish architecture," the M'Ewan Hall, Edinburgh, by Dr. Rowand Anderson, of which he speaks in terms of high praise.

In the *Magazine of Art* we have a largely-illustrated article by Mr. Lionel Cust on "The Malcolm drawings at the British Museum," and Mr. Claude Phillips continues his articles on Early Italian Art at the New Gallery, illustrated by some excellent small engravings from what was by far the most interesting part of the collection, the decorative work and jewellery. The first part of an article on Roubliaac and his work is contributed by Mr. Austin Dobson.

*The Studio* is a repository of various and interesting designs, sometimes eccentric, always clever. *The Studio* has been offering prizes for designs for pianoforte cases (uprights), which has resulted in some pretty designs of very good architectural quality, but the device of advancing side-pieces, the whole height of the instrument, closing in the keyboard at each end, which one competitor has adopted, will never do. A pianist likes free space at each side of him; elbow-room. The number contains articles on "Repoussé Metal-Work" by Mr. Nelson Dawson, "On Old Keys," by Mr. Aymer Vallance, with illustrations of some charming examples, and on "English Embroidered Book-Covers," by Mr. Cyril Davenport.

In the *Nineteenth Century* Lady Cowper writes a criticism on "The Realism of To-day" in art and literature. She observes that there are two schools of realism, the true and the false; the one the genuine acceptance and exposition of what is actual and true in nature, which depicts both beauties and defects, and is not blind to either. The fictitious realism recognises only one view of the object, in which either the redeeming side of what is ugly is left out, or the weak side of what is noble and beautiful is omitted. The modern Realists have adopted this one-sided view, and with them realism has become the synonym for ugliness. The split among the artists of the French camp, Lady Cowper considers, has resulted in the collection of the false realism in the *Chateau de Mars Salon*, to the average productions of which the works of Millet and Jules Breton must be a constant

\* The object of these notes is to point out anything in the contents of the current magazines which is of special interest to our readers, with occasional brief criticisms on the views expressed in such articles. When a magazine which has been sent to us is not noticed, it is because that number contains nothing that it is within our province to comment upon.

rebut. The argument is pursued, and some further comparisons instituted, with a great deal of insight and critical judgment.

*The Contemporary* contains an important article by Professor Müller on the excavations which have recently been carried on at Descanschiri, in northern Assyria.

*The Fortnightly Review* contains what may be called a remarkable article by Mr. Frederic Harrison, on "Constantinople as an Historic City"; remarkable both for its admirable literary style and for the broad and comprehensive view which it gives of the history of that city. Mrs. J. E. H. Gordon contributes an article on "Women as Students in Design," which is in reality a recommendation of Princess Christian's scheme, propounded at a public meeting a little while ago, and already mentioned in our columns, for founding a school of design for women.

*The Century* contains an article on "Millet's Life at Barbizon," described by his brother. A short note on Hobbema by Mr. T. Cole is accompanied by an engraving of his well-known picture of "The Avenue" in the National Gallery, which the writer justly regards as one of the finest and most typical of the painter's works. "My first and last balloon ascent," by Mr. R. V. Sewell, "A Comet-finder," a description of the telescope at the Red House Observatory, Phelps, New York, and of some of its discoveries, by Mr. F. W. Mack; and "A Summer month in a Welsh village" (Betgeleert), by Mrs. S. N. Carter, are among the contents of a very interesting number.

*Scribner's Magazine* contains an article on divers' work ("Life under Water") by a practical diver, which is of some interest as giving an insight into the conditions under which this particular industry is carried on, and which are naturally quite unknown to most of us. The same number contains an illustrated article on "French Caricature of To-day," apparently written by a Frenchman and translated.

In *Harper's Magazine* the article entitled "A Battleship in Action," by Lieut. Stanton of the U.S. Navy, is apparently intended as a glimpse at the future of naval warfare, in the same spirit as the remarkable article, "In a Conning Tower," which appeared in an English periodical (we forget which) some years ago. It is very well done, and worth general attention as a sinister prediction of what we are coming to. Mr. Abbey's illustrations to "Winter's Tale" are interesting as new attempts, but more successful in grouping and design than in the character of the separate figures; his "Autolycus" is a wretched failure.

In the *English Illustrated* is an article on "The marble-workers of Carrara," with illustrations of the Carrara quarries and their working by Miss Helen Zimmern.

Among the contents of the *Gentleman's Magazine* we find an article on "Jupiter and its system," with notes on the discoveries of the satellites, by Mr. J. Ellard Gore; "Old Westminster," a historical and topographical article by Miss May L. Sinclair; and a sketch of the "History of the Post Office," by Mr. J. A. J. Housden.

In the *Cornhill* an article on "Dress" reviews the often repeated but futile attacks on women's costumes as contrary to physiological laws, the writer remarking truly that "the inhuman outlines of the female figure shown in dressmakers' pictorial advertisements reveal an ignoring of vertebrate anatomy and a defiance of physiological demands which would move the Society for the Prevention of Cruelty to Animals if detected in the treatment of a colt, a lap-dog, or a costermonger's ass." We may add that in this respect the English fashion books are twice as bad as the French, which preserve some semblance of the possible appearance and proportions of the human figure even in tightly-pinchd dresses, while the English drawings are absolutely impossible caricatures, which one might think were calculated rather to alarm than to attract those for whose eyes they are specially intended. From internal evidence, the *Cornhill* article is apparently not written by a woman. In speaking of man's dress, the writer remarks on the instinct with which we seek for comfortable and loose-fitting clothes when about to perform work which requires either bodily or mental strain. It is only when idling that we can sacrifice to the absurdities of fashion.

*Blackwood's Magazine* contains an article on "A Lost English City," namely Dunwich, now represented by a small coast village with one church, the rest of the old town having been by slow degrees invaded and swallowed up by the sea. The extent of the ravage may be estimated

by the fact that at one time Dunwich contained fifty-two churches, of which not a vestige is except the one just referred to.

In *Longman's Magazine* Mr. W. Schoof devotes what may be called a "popular scientific article" to "The Pleiades," and marshals a facts which are striking enough; among other things that this garland of stars, to which poets of time have devoted pretty epithets, is an assemblage of worlds amid which our whole system would be an insignificant item, taking seven and a-half hours to cross the orbit of Neptune's orbit, while it would take years to cross from one extreme of the Pleiades to another. Such are the changes in our view of the relative proportion of things as advancing time has brought about.

In the *Religious* Mr. C. C. Hodge's article "The Pre-Conquest Churches of Northumbria" is continued; among other articles are "Roman Road through East Cleveland" by Canon Atkinson; and "Notes on the Cathedrals of Sweden" by Mr. T. M. Fallon.

*Pictures from Punch* is a very good book including some famous drawings of long which every one will remember and be glad to meet again.

#### ASSOCIATION OF MUNICIPAL AND COUNTY ENGINEERS.

A HOME Counties District Meeting of the Association of Municipal and County Engineers was held in the Town Hall, Reading, on Sunday, Mr. J. T. Eayrs, C.E., of West Bromwich, President of the Association, presided, and attendance, including a strong contingent of Metropolitan members, was one of the largest in the annals of the Association.

The members were received in the Town Hall by the Mayor (Councillor Field) and several members of the Town Council. In offering the members of the Association a cordial welcome the Mayor said that Reading was in a very prosperous condition, and in municipal matters not far behind the times. The visit would be instructive to Reading, and he hoped not to lose in benefit to the members of the Association.

The President, in acknowledgment, said it was of great interest to municipal engineers visiting the various towns throughout the Kingdom to see the progress made in municipal engineering. Wherever municipal engineers went they saw something to interest, something to gather, and he hoped did not go away without leaving some information behind. The interchange of ideas at their meetings tended to the improvement of the towns they represented.

On the proposition of Mr. C. Jones (Ealing), seconded by Mr. T. de Courcy Meade (Hornsea), Mr. A. Claude Robinson (Willesden) was elected *pro tem.* honorary secretary for the Home Counties District. Mr. Robinson, in acknowledgment of the proposition, which was unanimously adopted, said it was with regret he was compelled to retire.

Mr. A. E. Collins, A.M.Inst.C.E., Borough Engineer, Reading, read a paper on machinery applied to the breaking up of macadam, and said that of machines now in use in England the best known were the following:—Rutley's Scarifier, patented 1884; Voysey's Apparatus for breaking up streets, 1890; Jackson's Road Scarifier, March, 1891; Wallis's machine for breaking the surface of roads, Næves, 1891; Henderson's machine for breaking macadam, November, 1891. Messrs. J. Fowler & Company had recently made a machine which was being tested before being placed on the market. The Syracuse Chilled Plough Company, New York, make a Macadam plough which is drawn by horses. Having given details of construction of the various machines, Mr. Collins said that with regard to general results arising from the use of suitable machines his experience had proved that such work could be done more thoroughly and quickly than by manual labour at a cost which had not amounted in average to more than half that of manual work. With the scarifiers, including Henderson's machine, stones, chips, &c., were not projected through the air at all; with Voysey's and Hostess machine stones were not projected more than 3 ft., and not in such a manner as to cause inconvenience or danger; with the Wallis road plough the stones projected were at once stopped by the padded casing which encloses the apparatus. Consequently, it could be seen that one of the great inconveniences and dangers constantly arising when hand-picking was abolished.



was avoided by the use of either of the machines described. By the aid of a machine could be carried on at night-time as well as day, only ordinary hand lanterns being required to show the depth of cut, &c. In refacing rough roads which had sufficient, or nearly sufficient, upon them, a road-breaking machine was of great value. In most towns it was not possible to obtain sufficient men experienced in road-picking to break up a road at a rate approaching the cost of machine work.

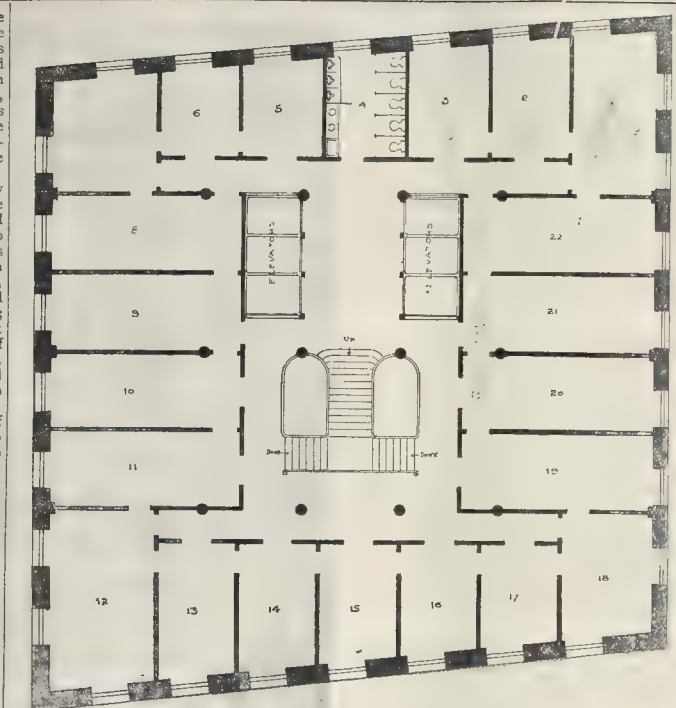
The various types of scarifiers were subsequently put to work on a trial length of road, and the representatives of the various firms interested were permitted to give additional details as to the merits of their machines. The most important statements were by Mr. Collins, the author, from particulars supplied by Mr. T. de Courcy Mead, the machine of the Hornsey Local Board had broken 26,000 yards at a cost of 3d. per yard; Messrs. Wallis and Stevens that in a trial at Brook 753 yards were broken up at a cost of 1d., which works out at 6½ yards for 1d., or, allowance for depreciation, at 5½ yards; and Mr. Evershed that he would be willing to undertake work at 3d. a yard.

Mr. Low (Hampstead), in moving a vote of thanks, said that Local Boards would be glad to have five yards of road could be broken up for a penny, as they had been paying, on contract, only a yard. The labour question was, however, so important, that the question of superintending hand by machine labour was a very difficult one for surveyors to deal with.

Mr. Weaver (Kensington), who seconded, read that while, if he were a County Surveyor, he would adopt one of the machines, he should think of doing so in the metropolitan district, where there are so many plug-boxes, electric light poles, and other obstructions in the roads. After a discussion the vote of thanks was carried.

Mr. A. T. Walker, Assoc. Mec. Inst. C.E., Waterworks Manager, read a paper entitled "The extension of Reading Waterworks and the use of Polarite therein." He spoke highly of the success which had attended the use of polarite as a filtering medium.

Mr. A. E. Collins next read a paper on "Some Municipal Works in Reading." He said the population was 63,000, and the rateable value £100,000. The population had nearly doubled in fifty years, owing principally to the large influx of many of its industries. The most important municipal work carried out had been the purchase and preparation of the sewage farm and the construction of the sewerage system and the pumping station. The works had cost £350,000. Sewage was first pumped to the farm about twenty years ago; it had received the effluent of the borough since then. The town was on the separate system. Each street had its own distinct system of sewers, one for sewage, one for surface water; likewise each house had its own system of drains. As a result ordinary drainage had no appreciable effect on the flow of the sewage pumping station. The average quantity pumped was about 1,500,000 gallons per day. In December last he recommended that experimental trials be made to show whether domestic refuse could profitably be burnt in the furnaces of the three Lancashire boilers supplying the steam engines. Temporary forced blast furnaces were made at the pumping-station and at the boiler furnaces. During the past few months the engines had been driven by steam raised from the combustion of unprepared refuse only. The amount of refuse consumed averaged about 18 tons per day. It required two boilers heavily fired with refuse to produce as much steam as one boiler lightly fired with medium quality steam coal. Not the least nuisance had been experienced. With reference to the financial aspect, in Reading all the refuse could be pumped by water during about six months in the year; during that time only a quantity of cheap refuse coke was burnt to the boilers hot and maintain draught in the flues for the purpose of maintaining the temperature of the outfall trunk sewer; consequently it would be seen that a large saving in the cost of fuel could not be effected. On the other hand, the handling of large amounts of house refuse and clinker necessitated considerable cost of labour. As a result he found the cost of running the sewage pumping machinery would be reduced by about 145% per annum by running the machinery throughout the year, using refuse as fuel. During such periods as power was not available, and steam must be used, a saving of 10% per week was effected, and that, where water-power was not available, a



American Surety Company's Building, New York.—Plan.

large saving would be effected by the use of house refuse instead of coal. Notwithstanding that a loss was made at the pumping-station by the use of house refuse, a saving was made in the cost of collection and disposal, and the net result was a saving of about 320% per annum. Sewage was applied to the land in its raw state with results, as far as crops were concerned, which were not always satisfactory. The author also described the various public offices and works belonging to the town.

In the afternoon the members visited the Corporation workshops, the Blake's Lock sewage pumping-station, the Fobney waterworks, and the gasworks, where various labour-saving appliances were inspected.

#### COMPETITIONS.

ODDFELLOWS HALL, DORKING.—We are informed that the design submitted in this competition by Messrs. W. & G. Shearburn, architects, Arundel-street, Strand, and Dorking, has been accepted.

A NEW CASTOR.—Harding's patent "Globe Castor" is another attempt to make a spherical castor which will move freely in any direction, a thing which in our opinion cannot really be done on any theoretically correct mechanical principle, though such a thing may practically be made to work to a certain extent. Mr. Harding's castor is made of larger size than usual, forming a globe proportioned to the average thickness of the leg of the furniture, and is made of a thin hollow shell of hard and highly-polished metal working in an inverted cup of a section of a little more than a hemisphere, so as to keep the castor in its place. The castor bears upon a small polished steel button in the upper portion of the cup. The principle of course is to design the castor and its bearing so that there should be less frictional binding between them than between the castor and any floor substance to which it is likely to be applied, and no doubt the example shown to us did work so; but it is a faulty principle, dependent entirely on the maintenance of the two metal surfaces in a high state of polish, which in practice would be difficult to maintain, and we should expect to find that the heavier the piece of furniture it was applied to the less likely it would be to work satisfactorily. However, it is an ingenious attempt, and may be worth trial; but we never have much faith in the future development of a mechanism which is not perfect in principle.

#### Illustrations.

##### BUILDING FOR THE AMERICAN SURETY COMPANY, NEW YORK.

THE new building projected by the American Surety Company, New York, promises to be one of the most interesting in that city. The design submitted by Mr. Bruce Price has been chosen for erection, that being judged the best out of nine submitted by nine of the leading architects in New York in a limited competition. Mr. Richard Morris Hunt was the professional adviser of the company, and each architect was paid 750 dols. for his drawing.

The conditions were somewhat novel. The site is approximately 85 ft. by 85 ft., though not quite square. For this plan were required for a building from fifteen to twenty stories high. Most of the competitors submitted designs for a twenty-story building, and Mr. Price, whose twenty-story design was accepted, submitted an alternative for a building of twenty-seven stories. The proposed building, having a height of 300 ft., naturally takes the form of a tower, and negotiations are in progress whereby the company hope to secure control of the adjoining premises, which extend around their own lot, and which it is known will not be built upon for many years to come, thus justifying them in continuing the design of the main façades around the four sides of the building. As the best views of this structure will be obtained from the waters of New York harbour, the architect will have an unusual opportunity of erecting a business building of monumental character that may be seen from all points. This action is somewhat significant, since most of the high office buildings in New York are designed with reference to their street façades only, and present nothing but huge unbroken walls of brick to the water fronts.

The building is to be built of white granite. The main entrance, on Broadway, is through a semi-circular apse immediately behind the Ionic porch. The first-floor will be fitted up for banks, which will have direct connexion with safety vaults in the basement. The second-floor will be fitted up for a large corporation, the third, fourth, and fifth for the uses of the American Surety Company itself, and the remainder of the building for offices, chiefly for lawyers. The annexed typical floor plan shows one of these



stories divided up into small offices, which it is proposed to rent in suites.\*

The illustration is from the perspective submitted by the architect in competition, and shows the building as it would appear from a point 300 ft. distant were all the intervening buildings removed. It therefore presents a better view of the building than can ever really be had. Broadway, which the building faces, is but slightly over 80 ft. wide, and Pine-street, the cross street, is but 35 ft. wide. The Equitable building, directly across Pine-street from the Surety building, is about 120 ft. in height. Trinity church-yard is directly opposite the Broadway front of the building, and a good view of it will be had from its lower side, a block away.

It is estimated that the building will cost 1,000,000 dols. to erect. The land on which it will stand cost 1,435,000 dols.

#### ST. MARYLEBONE GENERAL DISPENSARY, WELBECK-STREET.

The view shows the front block of the dispensary, which is No. 77 in Welbeck-street. It is occupied with the board-room, upon the first floor; committee-room, resident medical officers' apartments, and official residence, in the upper stories; and housekeeper's rooms in the basement. Reference to the ground-plan, published under date April 15, 1893, in the *Builder*, with the view of the patients' entrance in Marylebone-lane, will explain the arrangements of the Institution, which provides consultation rooms and a dispensary, and waiting-halls and offices.

Messrs. T. H. Adamson & Sons were the contractors for the front block now illustrated. The carving is by Messrs. Farmer & Brindley, and the ironwork by Mr. Boulting, of Marylebone.

The general character of this front of the building, containing the residences and board-room, has been purposely differentiated from that of the patients' entrance front in Marylebone-lane. The architect is Mr. Beresford Pite.

#### METROPOLITAN LIFE ASSURANCE SOCIETY.

The illustration is of the principal entrance to the building in Moorgate-street which has recently been erected by the Metropolitan Life Assurance Society. The building has been built in two blocks, the society occupying the basement, ground, and first floors of the larger block, the remainder being arranged for letting in blocks of offices. The basement of the society's portion is mainly occupied by extensive strong rooms fitted in the most secure manner by Messrs. Chubb & Co. On the ground floor is the main office, the actuary and the assistant actuary's rooms, and a committee room. On the first floor a board-room, doctor's and dressing rooms, waiting-room, and director's luncheon-room. A double staircase leads by the one flight from the ground floor office to the board-room, and by another flight to the offices over the society's portion which are entered from Coleman-street, a great deal of valuable space being saved on the ground floor by this arrangement. The walls of the ground floor are panelled to a height of about 10 ft. in Spanish mahogany, with a lining of cipolline marble above. The board room is also partly panelled with Spanish mahogany. The desks, screens, fireplaces, and other fittings are all in a similar material, and especially designed by the architects. Portland-stone is used throughout the fronts, with a polished base of Cornish granite. The electric light is fitted throughout.

The contractors were Messrs. Cubitt & Co. The architectural sculpture is by Mr. W. S. Frith; the sanitary work by Messrs. Dent & Hellyer, the electric lighting by Messrs. Strode & Co. The whole was designed by Mr. Aston Webb and Mr. E. Ingress Bell, and their clerk of works was Mr. T. Warburton.

#### S. PETRONIO, BOLOGNA.

The church of S. Petronio, as we see it to-day, is only the first portion of a vast project by which the Bolognese were to have the largest church in Italy.

Siena and many other towns had striven for centuries for the same honour, but misfortunes had fallen upon them, and Bologna, too, found its ambition unrealisable.

The church, commenced in 1390, by Antonio

\* For the omission of any scale to the plan we are not responsible. It was sent to us from New York without a scale, which we have no course no data for supplying.



Portway, St. Marylebone General Dispensary.

Vincenzi, if completed, would have been 600 ft. in length, with transepts, and a dome over the crossing. The present church is only the nave of this scheme, and owing to its great width and the enormous span of its arches, it has a vastness unsurpassed, perhaps, by any church in Italy. This nave measures 384 ft. in length, and, with the chapels, 150 ft. in width. Many designs were made by the architects of the Renaissance for the completion of the façade, amongst whom may be mentioned Palladio, Vignola, and Giulio Romano, but it still remains unfinished. The chapels contain many frescoes and other works, and are divided from the aisles by beautiful screens of marble.

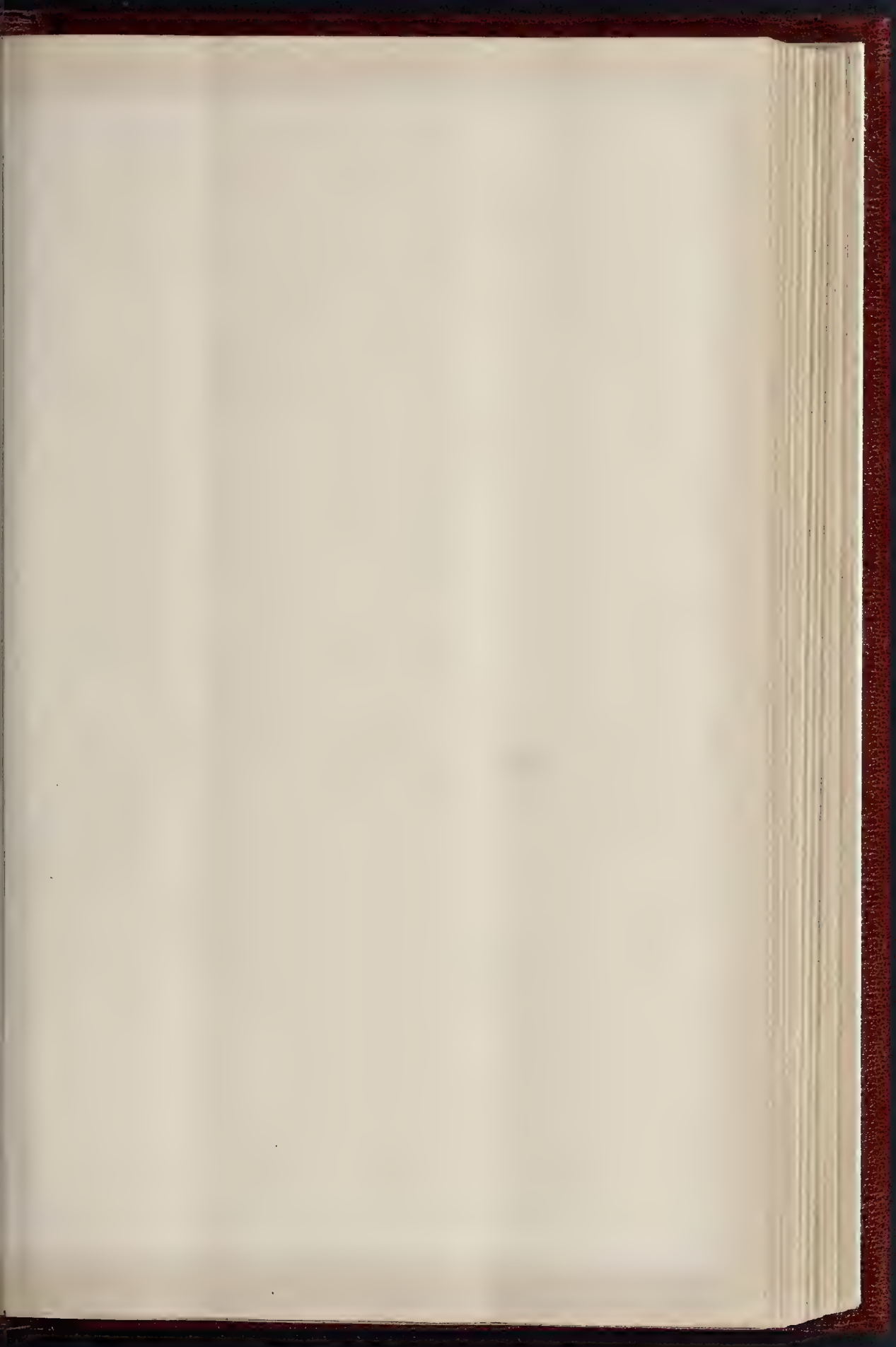
Though the interior of S. Petronio has no special claim to beauty of detail, though its walls are bare and cold, still there is something extremely picturesque in its great level floor, dying away unbrokenly until it loses itself in mystery.

FRANCIS W. BEDFORD.

#### PALAZZO DELLA CASA, GENOA.

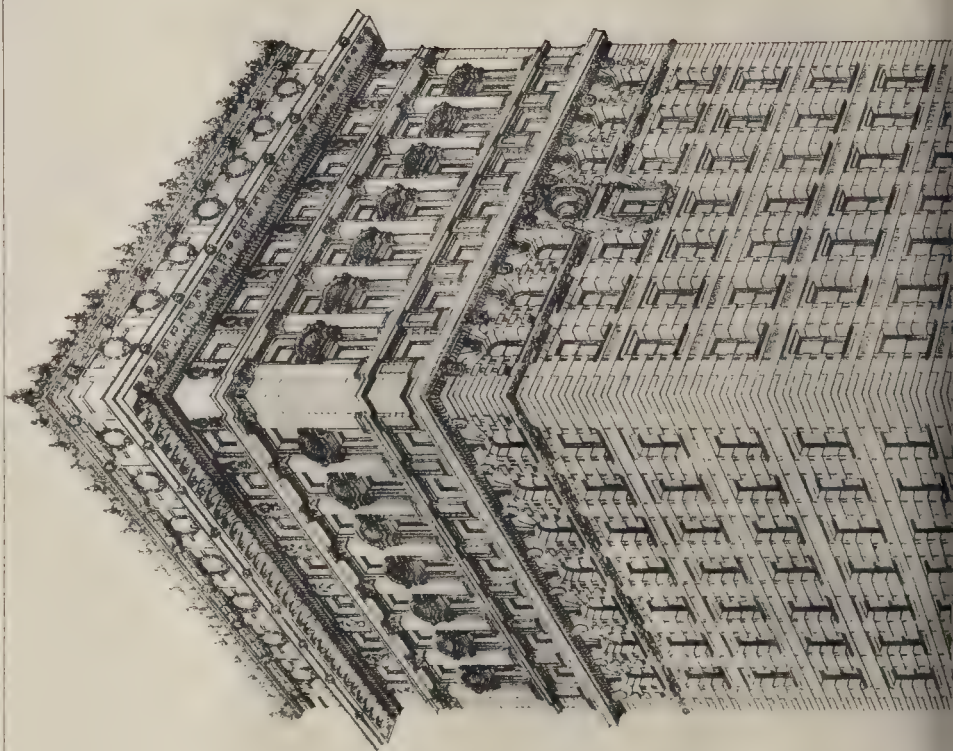
This quiet, fifteenth-century, unpalatial "palazzo" occupies a prominent site facing the Piazza Fontane Morose.

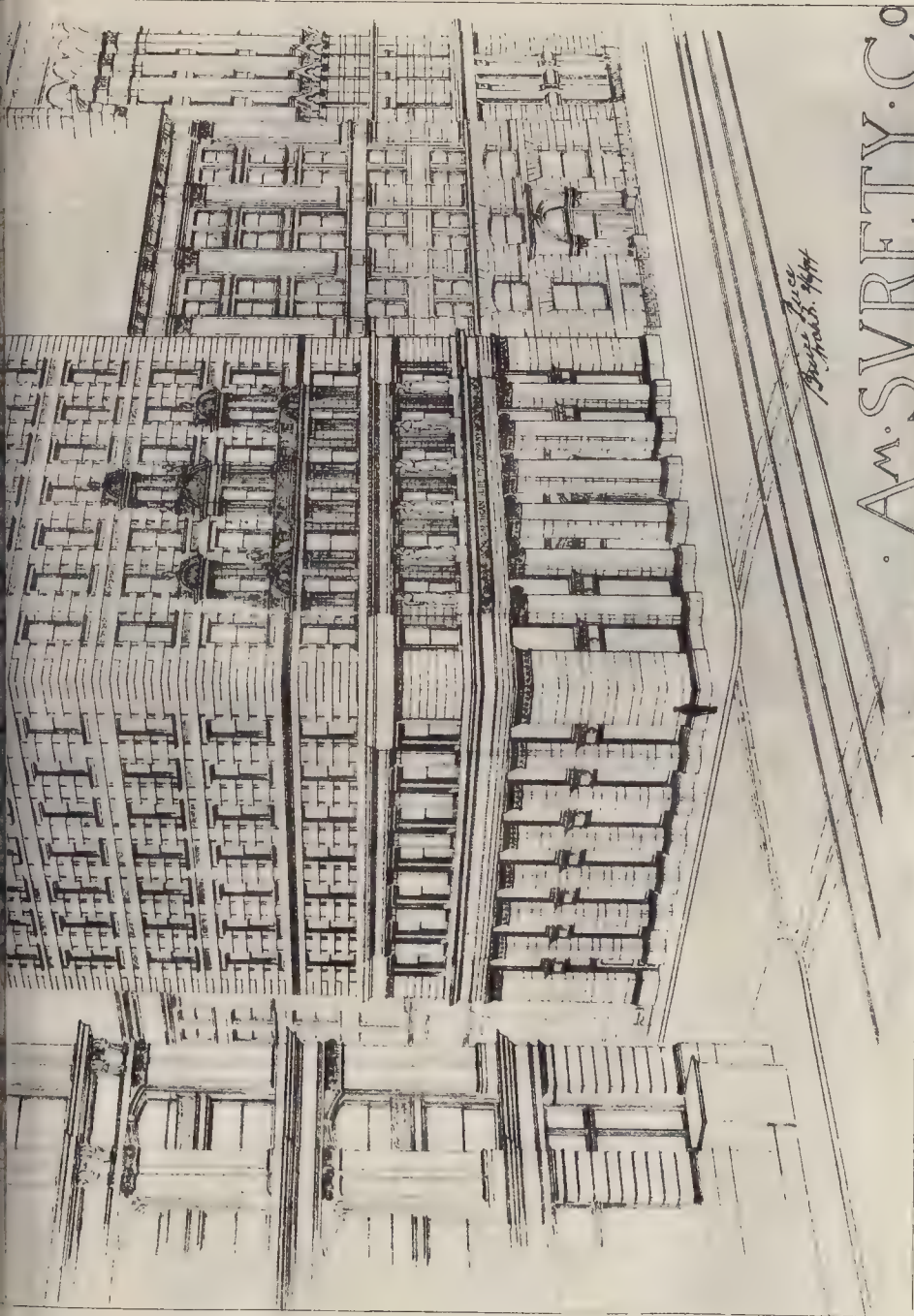
The materials with which it is built, and the restraint shown in its design by the square, unbroken outline and façade, constitute its chief





THE BUILDER, APRIL 14, 1894.





AMERICAN SURETY CO.

THE PHOTOGRAPH BY J. C. ALLEN, 445 EAST MADISON STREET, CHICAGO, ILL.

*Bruce Price  
March 13, 1914*

BUILDING FOR THE AMERICAN SURETY COMPANY, NEW YORK.—MR. BRUCE PRICE, ARCHITECT.

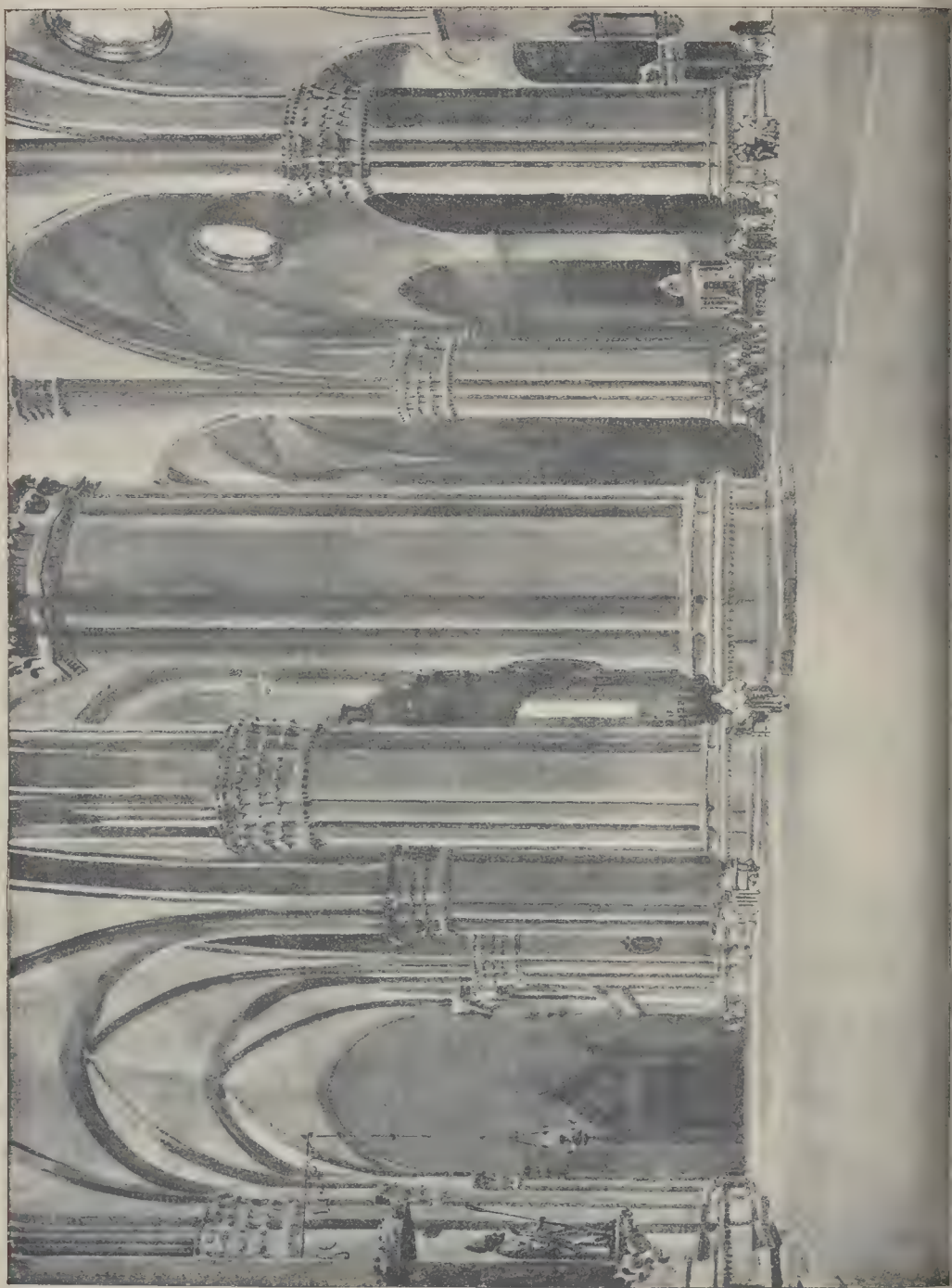








THE BUILDER, APRIL 14, 1894

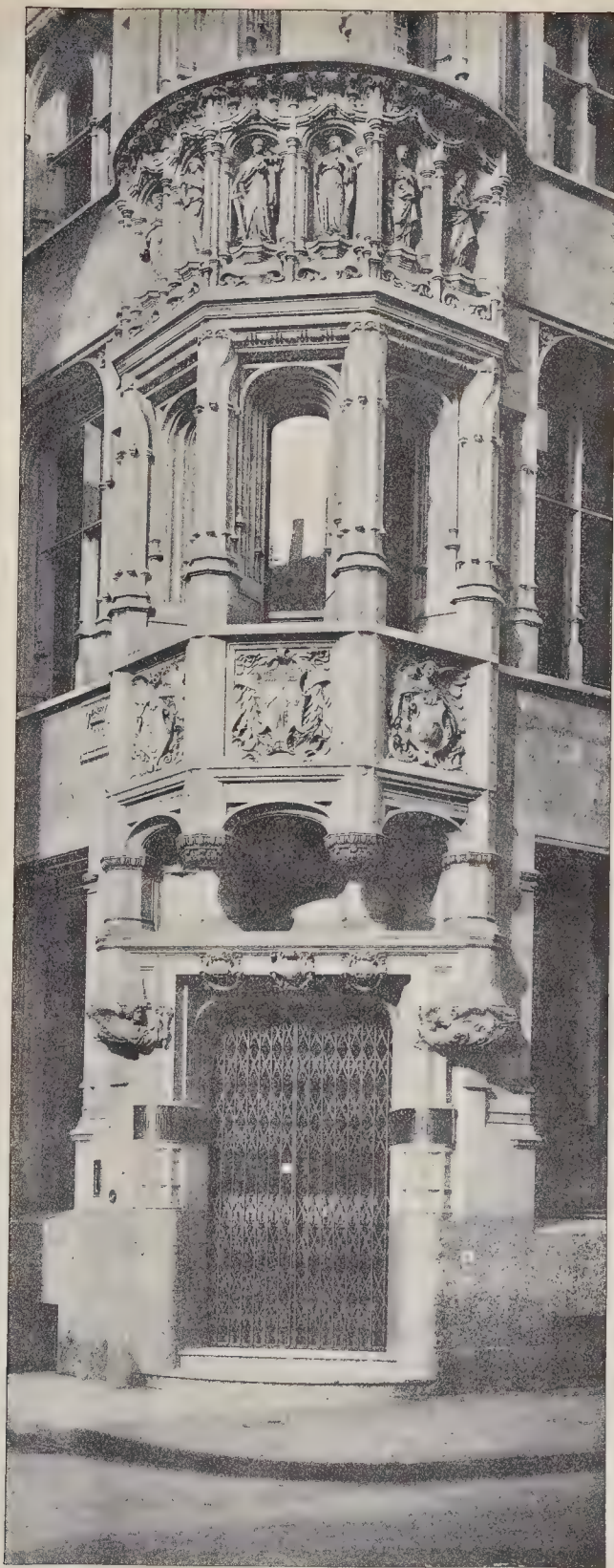








ST. MARYLEBONE GENERAL DISPENSARY, 77 WELBECK STREET. MR. BRESFORD PITT, A.R.I.B.A., ARCHITECT.



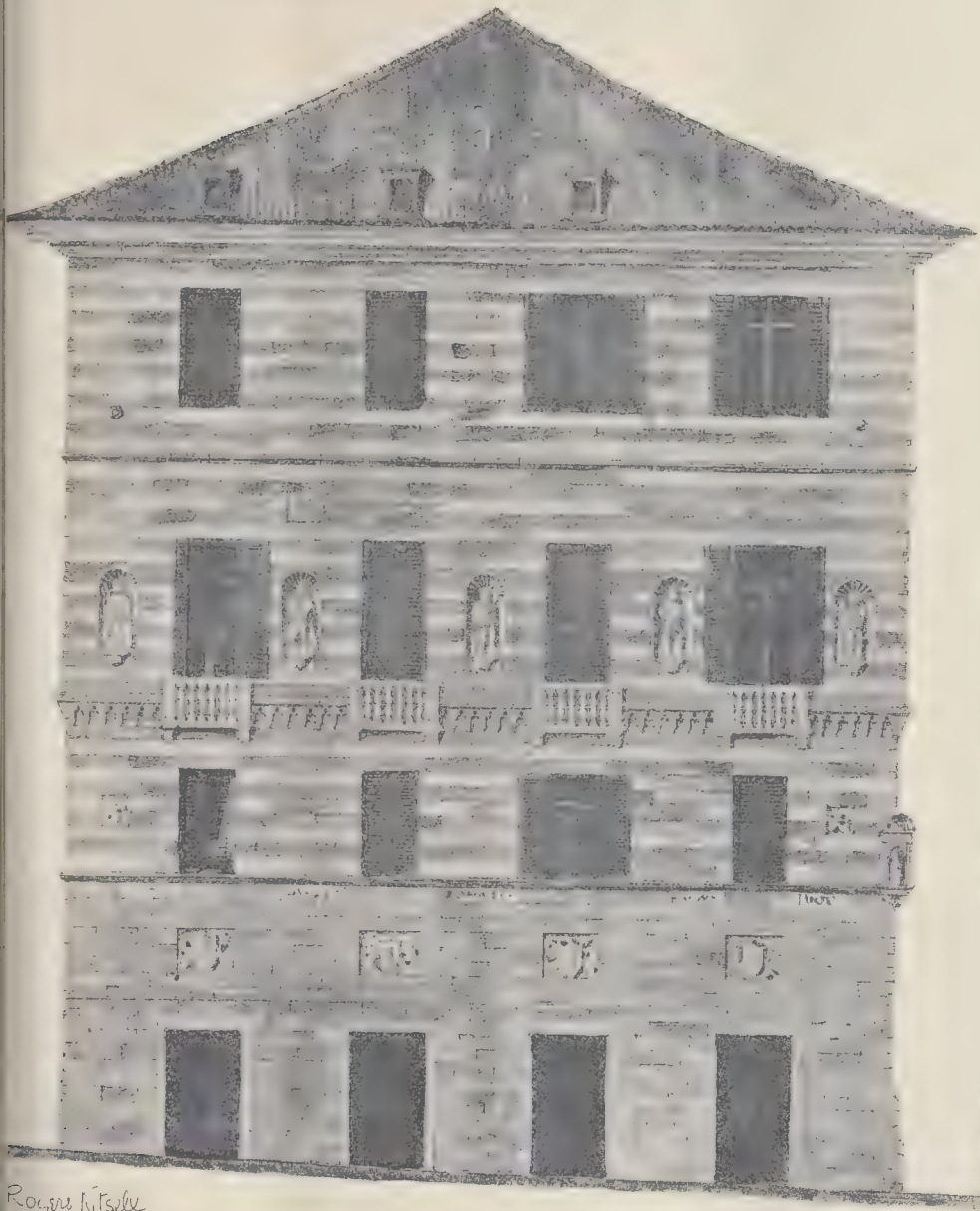
METROPOLITAN LIFE ASSURANCE OFFICES, MOORGATE STREET, E.C.  
MESSRS ASTON WEBB & E INGRESS BELL, ARCHITECTS.





Palazzo della (Casa) (originally, Spirito)

SE. 1011



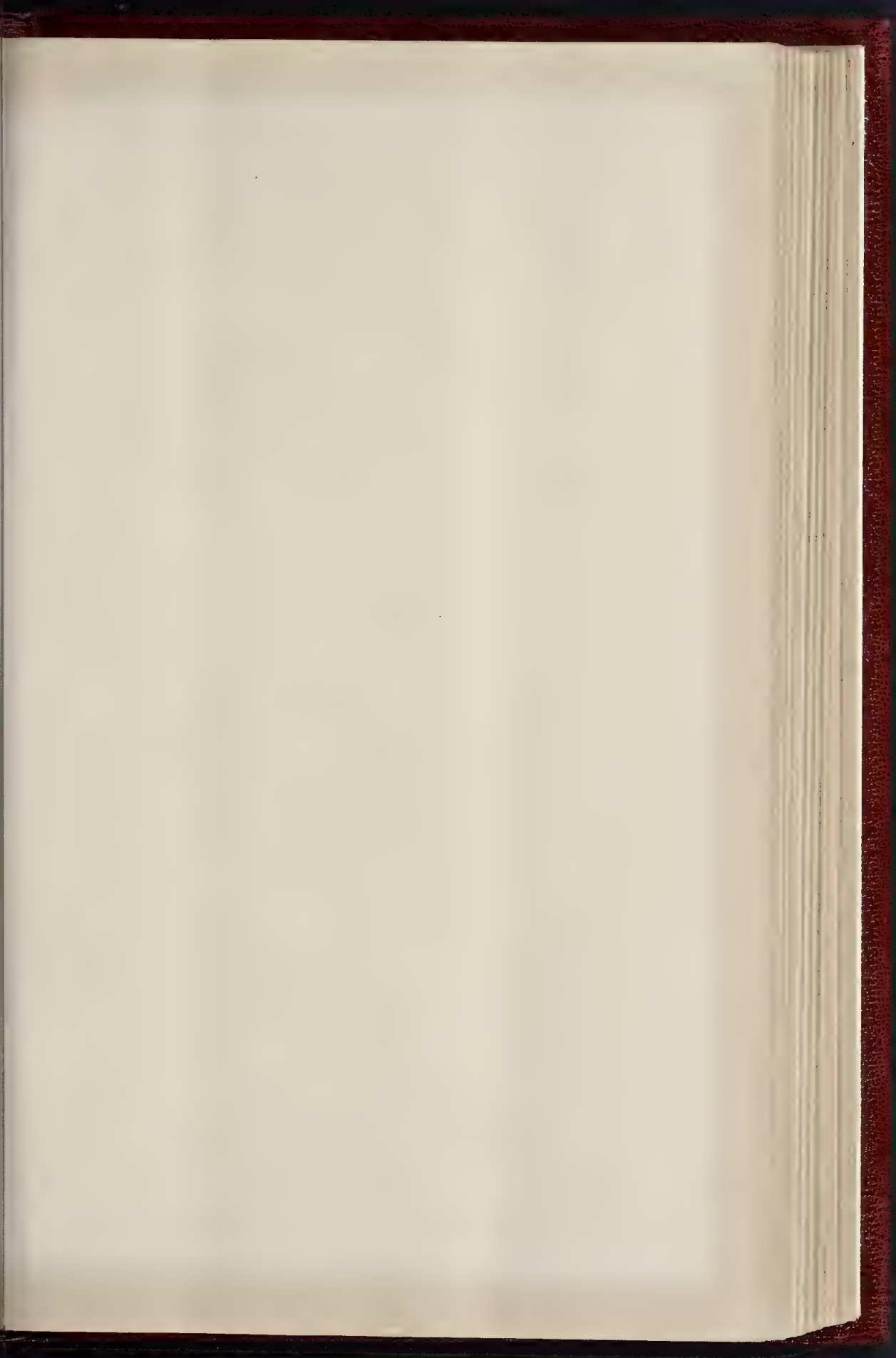
Rogers  
1892

Elevation, towards the Piazza delle Fontane Morose

Scale 10 15 20 30 40 50 Feet











HYDE PARK MANSION





PHOTO LITHO BY SPALLS & CO. 44, EAST HARDING STREET, LONDON. JUNE 20.







FIRST FLOOR PLAN.



GROUND PLAN.

Metropolitan Life Assurance Offices.

HYDE PARK MANSIONS.

We have no information from the architect about this building, the view of which we give in the present number as affording a kind of contrast or pendant to the American manner of designing buildings for a multiplicity of occupants, illustrated in another plate in this issue. The English building "in flats" is simply a very extended street house, or a continuation of street houses, of the ordinary type. The American extends his building vertically instead of horizontally, thereby producing a striking appearance and securing for the proprietor a great deal of rent out of his site, but at the cost of overpowering the ordinary buildings and robbing them of a great deal of light. On the whole perhaps the English system is more conducive to the greatest happiness of the greatest number.

SANITARY INSPECTORS' ASSOCIATION.

An interesting paper dealing with the present position of Paris with regard to water supply and drainage was read before a meeting of this Association on Saturday last, at Carpenters' Hall, London Wall, Sir Benjamin Ward Richardson presiding. In the absence of the author of the paper, M. Bechmann, Chief of the Sanitary Service of Paris, the President read the paper, which dealt, firstly, with the scheme projected more than thirty years ago by the then Chief Engineer of Paris, M. Belgrand, for providing an ample supply of water to the French metropolis. This great project, only recently completely realised, provides for the two and a half millions of people a water supply of 44 gals. per head per day, of which 26½ gals. are drawn from the Seine, the Marne, and from the Ourcq Canal, for use in the streets, gardens, factories and workshops, and 17½ gals. for household purposes. The domestic supply is carried in separate pipes from its sources in the chalk formation to all the stories of Paris houses, and it is described in the paper as perfectly bright, pure, fresh, and palatable. Both systems of pipes are under constant pressure, the water delivered to the houses being measured by some 65,000 water-meters. An additional twenty-two litres of pure spring water can be supplied even in the heat of summer, should it be required, and the public supply can be increased by nearly 50 per cent. on any emergency. In short, it is claimed that the drinking water of Paris is quite as good as that of Vienna, long esteemed the best in Europe, and is much beyond all present wants. Of the drainage system of Paris, M. Bechmann has not so good an account to render. Out of the 1,400 kilometres of streets in Paris, one-seventh are still without any drain, and covered cesspools remain in the greater number of private dwellings. Three-fourths of the total sewage of Paris is discharged into the Seine near the Pont d'Asnières, close to walls of the city. The remaining fourth of the sewage is treated at Gennevilliers, in irrigation fields. The Parisians, proud of the magnificent subways which had been established in one half of Paris, at the death of M. Belgrand in 1878 and heedless of the efforts of enlightened engineers like the late Messrs. Alphand and Durand-Claye have remained satisfied, until recently, to retain 64,000 cesspools, 17,000 ordinary pails, and 34,000 dividing pails. There is now at last a prospect of the full realisation of the great schemes of the departed engineers, although an eventual expenditure of 143,000,000 of francs, or 5,720,000£ sterling, has to be faced. The works actually in progress involve an expenditure of over 2,000,000£ on new sewers and the improvement of old ones, and upon a new irrigation field at Achères costing 368,000£, which is expected to be in full working operation next spring. Within five years, when the new works contemplated by a Bill suggested and supported by the State authorities will be completed, it is the opinion of M. Bechmann that the Seine will no longer be polluted by Parisian sewage, except perhaps at the time of the very rare storm overflows, and within ten years the sanitation of Paris will be very nearly perfect. The new law, of which Paris is in daily expectancy, will mark a new era for the French metropolis, where a perfect system of drainage, added to the already excellent water supply, must have the happiest influence upon public health and the bills of mortality. A vote of thanks having been given by acclamation to M. Bechmann, the meeting discussed the procedure to be followed at the forthcoming annual conference of the Association, proposed to be held at Nottingham on the 11th and 12th prox. The first day, Friday, will be

ms. Almost the only enrichment is con- rated on the second floor, where the cusped el course and the balconies below and niches in statuettes between the windows are used admirable discrimination and effect. further effect is given to the front by the ses of variously-coloured materials. The nd stage up to the first string-course is of k or dark grey marble, with inserted carved ls in white marble, and white marble jambs sorways. The other three stages are built in

alternate courses of black and white or cream- coloured marble, with black or dove marble string-courses. The balustraded balconies are of white marble, and the corbelled string-course between is of black, with white marble top and bottom members. The niches and figures are of white marble, as is also the main cornice. The window jalousies, &c., are painted green, and the roof is covered with red pantiles, all mellowed by time.

T. ROGERS FITSELL.



spent in visits to the sanitary works at Eastcroft, the destructor furnace, &c., with a meeting in the evening, followed by a concert. On Saturday, after a reception by the Mayor of Nottingham, Mr. Alderman Pullman, the conference will take place, when addresses will be delivered by Sir W. B. Richardson, Sir Samuel J. Johnson, Town Clerk, and Dr. P. Boobyer, M.O.H., and after luncheon visits will be paid to the Castle Art Museum, University College, and other places of interest.

#### THE LONDON COUNTY COUNCIL.

On Tuesday the first meeting of the London County Council after the Easter recess was held in the County Hall, Spring-gardens, Mr. John Hutton, the Chairman, presiding.

**London Streets and Buildings Bill.**—The Parliamentary Committee reported as follows in reference to the London Streets and Buildings Bill:—

"A Sub-Committee of this Committee to which the Chairman and some members of the Building Act Committee are acting, have been considering the provisions of this Bill for some time past, and have submitted to us certain amendments which we have fully discussed, and have decided to advise the Council to adopt. We have directed a copy of the amendments to be sent to each member of the Council, but a few words of explanation are required with respect to them. Part IV. of the Bill relating to open spaces about buildings and height of buildings, as originally passed by the Building Act Committee and by the Council, was intentionally drawn in a sweeping form. The provisions were not only more drastic than the Committee thought likely to pass, but in some respects might be considered as going further than the needs of the case demanded. The process of consolidation involved much more re-drafting than had been anticipated, and this process led to yet further stringency in Part I. relating to the formation and widening of streets, and Part II. relating to lines of building frontage. The whole subject is best viewed with extraordinary difficulties, which centre in the fact that building legislation has to be applied to the most diverse cases, and under greatly-varying circumstances. Building sites differ greatly in size, shape, and situation; buildings are of all sorts and sizes, and adapted to the most varied uses—dwelling-houses, hotels, offices, shops, warehouses, and factories; dwelling-houses again are very differently circumstanced, and the same set of rules are not required for a large house in Mayfair and for a cottage in Rotherhithe, while a block of residential flats requires treatment different from either. The problem was so to strengthen the law as to make it impossible to erect unhealthy dwellings, while at the same time interfering as little as might be with the trade of London, in which all sections are equally interested. After trying various principles of exemption, it was considered that it would be better to wait and see what form opposition to the Bill would take, and then to frame exempting clauses to meet it as far as might appear proper and reasonable, and the Bill adopted by the Council was framed in this sense. Accompanying a general desire for a good Bill to consolidate and amend the present legislation on the subject, there was a yet more general and unyielding opposition to several of the more stringent provisions of the earlier parts of the deposited Bill. We admit the force of the argument, confirmed as it is by the experience of provincial towns, that building regulations, if too stringent, may defeat their own object. While it is most desirable that every new building erected and every addition made to an existing building should be planned and constructed on the most improved principles, it is equally desirable that property owners should not be discouraged from improving old buildings, or hampered in carrying out small additions to or modifications of their property. Rules and restrictions which may be fairly imposed upon owners laying out new streets, or building upon land hitherto uncovered might, and in many cases would, press with undue severity upon the owner of old buildings abutting upon a narrow ancient street. In such a case the obligation to set back or to give up land at the rear might make rebuilding quite impracticable, or at any rate involve such great loss or expense as to be prohibitory. Such a system would accordingly deter owners from making desirable improvements which might be practicable, and cause the retention for long periods of years of old buildings of a most unsatisfactory character. Since the deposit of the Council's Bill our sub-committee have had several long interviews with representatives of various bodies which have been of the greatest assistance to them, and have led to the following results:—(1) A large number of small technical amendments have been made with the full concurrence of all parties. (2) A set of amendments designed to meet as far as possible the main objections to the earlier parts of the Bill have been drawn up. As regards the latter, we and the delegates agree with the Council that to exempt the City of London, as such, from any clauses of the Bill was objectionable in principle. The character of streets and buildings, rather than their geographical position,

should be the criterion. Accordingly it is proposed to interfere as little as may be with premises devoted to business purposes; it is also proposed to deal more stringently with dwellings adapted for the use of artisans and labourers than with other houses. Those who live in the better class of houses are not nearly so crowded together for room as are the poor, while at the same time they are in a much better position to protect themselves. The sub-committee are of opinion, in which we concur, that, while the proposed amendments will minimise interference with the many classes of property which it is not decided to disturb, they will effect those sanitary improvements (more particularly as regards free access of light and air), which the Council is so desirous to obtain. *Inter alia* the Bill amended by us would effectually prevent the present glaring evil whereby an owner is allowed in rebuilding upon old sites to make matters much worse than they were before. Moreover, and this is a point of great importance, the Bill as amended would be far easier to administer than its original form. Legislation under which exemptions tend to become the rule rather than the exception is bad legislation. For these reasons it will be vastly easier to support the Bill as amended by us in Committee. The concessions which have been made to opponents (whose opposition was to a great extent quite justifiable and reasonable), will greatly diminish the cost of promotion, and what is scarcely less important with a view to a successful issue, materially shorten the procedure in Committee. Lastly, it appears to us much better policy to discuss, and as far as may be, agree upon beforehand the limitations to which the clauses must be subjected rather than to be driven to accept without adequate time for consideration amendments put forward for the first time in Committee. The amendments which we have adopted involve so many technicalities that it would be difficult and tedious to explain their precise bearing in every case. With regard to Part IV., relating to the open spaces about buildings and height of buildings, we have amended the same materially, and we recommend—

"That the amended provisions of Part IV. as now circulated be approved and adopted by the Council."

Mr. Cohen, M.P. asked the chairman of the Parliamentary Committee whether his attention had been drawn to the question which had been asked in the House of Commons that day as to the price at which alone the Bill was to be obtained? The Bill cost 6s. 2d. per copy, and those who were opposed to it had some ground for complaint as to its cost.

Mr. Charles Harrison said the charge was the usual charge for all private Bills promoted by the Council.

Mr. Westcott proceeded to refer to clause 176, when,

Dr. Longstaff said that the Committee recommended the withdrawal of clause 176 entirely.

Mr. Beachcroft moved the following amendment:—"That, having regard to the serious character of the amendments now proposed to be made in the London Streets and Buildings Bill, and the fact that there is not time before the Bill reaches the Committee of the House of Commons for the Council to give the amendments any consideration, or to ascertain the views of experts and those capable of giving assistance in solving the problem, the Council do withdraw the Bill from Parliament with a view to presenting a more fully digested one next session." The Council was asked, he said, to put forward a Bill in a totally different form from the one which they considered in December, and in his opinion, when once they had put their foot forward, they should not draw back. The Bill could not be satisfactorily dealt with in that manner; the Council should have before them on the one hand a Consolidation Bill and on the other an Amendment Bill, in order that they might know what were the amendments which they were considering. He held a very strong opinion with regard to the question of setting back a building on a narrow street. The Bill they were putting forward was an amateur's Bill. In his opinion it should have been a Government Bill.

Mr. Campbell seconded the amendment.

Dr. Longstaff said he had been interested in the question for the last five years, but it was only during the last few months that he had realised the whole of its difficulties. It had been said that they should consult experts, but it was almost impossible to get much from that direction. The best plan, and the one which they had adopted, was to place before experts their proposals, and the experts would then say what they thought. This had been done in the case of the Bill they were considering. The Bill had, in reference to certain parts, particularly Part IV., called forth a perfect storm of opposition from those interested, but he thought that, with some necessary modifications,

the Bill might pass; unaltered it would have been impossible to pass it.

The amendment was then, upon a show of hands, declared lost, and the recommendation of the Committee was agreed to.

**Lincoln's Inn-fields.**—The same Committee reported that the benchers of Lincoln's Inn did not intend to oppose the provisions of the London Improvements Bill for the acquisition of Lincoln's Inn-fields, and that there was the probability of the opposition of the trustees being withdrawn on certain conditions. They recommended—

"That if necessary to secure the withdrawal of the opposition by the trustees and inhabitants, we be empowered to assent to the payment of the agreed sum among the persons interested upon their interests being vested by the Act of Parliament in the Council, subject to the conditions as to the user now in the Bill."

Several members opposed the recommendation on the ground that the payment they understood to be contemplated was larger than, in their judgment, was justifiable, but the recommendation of the Committee was ultimately agreed to.

**The Council's Water Bill.**—The same Committee also reported as follows:—

"Since our last meeting the prospect of being able to proceed with this bill has been largely diminished by the debate on the second reading of the East London Water Bill and other water bills on the 24th instant. Having regard to observations which fell from members of the Government in the course of the debate as to the necessity of the Council promoting some more practical measure, we think it quite useless to proceed with the present bill, and we recommend—

"That the London County Council Water Bill be not further proceeded with."

The recommendation was agreed to.

**Castle-alley, Whitechapel.**—On the recommendation of the Improvements Committee it was resolved to contribute one-half of the cost of £2,000. of widening Castle-alley, Whitechapel.

**Wellington-street and Strand Widening.**—The same committee brought up a report, which was printed in the *Builder* for March 17, page 217, respecting the widening of Wellington-street and the Strand.

They recommended—

"That, subject to an estimate being submitted to the Council by the Finance Committee as required by the statute, the Council do accept the terms and conditions of the Duchy of Lancaster for the reversion to the freehold of the property required for widening Wellington-street and the Strand, and carry out the improvement as shown upon the plan submitted with this report; and that the solicitor be instructed to prepare the necessary agreement with the Duchy."

Mr. Costelloe moved that the recommendation be referred back, especially with regard to the expediency of applying in this case the principle of betterment.

Mr. Hollington said the Duchy had agreed to take 8,000l. less than was originally asked for on condition that no betterment clause was inserted.

On a division, the amendment was adopted by 34 votes against 31.

After transacting other business the Council adjourned at half-past 7 o'clock.

#### ARCHITECTURAL SOCIETIES.

**CARLISLE ARCHITECTURAL, ENGINEERING AND SURVEYING ASSOCIATION.** The usual fortnightly meeting of this Association was held in the Town Hall on the 4th inst., when a paper was read by Mr. T. H. Hodgkinson of "The Strength of Beams and Simple Structures." The paper was illustrated by diagrams showing the various modes of loading beams, and examples of wrought and cast iron and rolled and cylindrical beams. These the lecturer explained in detail and pointed out the nature and direction of the forces, acting upon them under the varying loads, both live and dead, and gave the factors of safety generally taken for the different materials. He also gave several useful formulae for working on the strains at the different points under general conditions, with the constants deduced from the breaking weights of the materials mostly used in the construction of beams, &c. Examples of braced girders, and the construction of crane framings, with the amount of stress on them when loaded and occupying different positions, were also dealt with, and in the course of his remarks the lecturer said that whereas the material turned out by a British firm can generally be relied upon, the same cannot be said of some of the material supplied by foreign firms, notably Belgian.

**EDINBURGH ARCHITECTURAL ASSOCIATION.**—On the 4th inst., at a meeting of the Edin-



burgh Architectural Association, Mr. W. W. Robertson, President, in the chair, a paper on "The First Wall of Edinburgh, or the King's Wall, and Some Evidence Relating Thereto," by Mr. S. Aitken, F.S.A. (Scot.), was read by Mr. S. Aitken, F.S.A. (Scot.). Dr. Miller said that the King's wall was built in 1450, but from a charter of James II. it appeared that this wall formed the boundary of the town on the south side of the High-street at an earlier date. The line of the wall, as shown with the aid of a limelight view, passed in almost a straight line from the Castle to the Netherbow, its course being through the centre of the block of houses on the south side of the High-street. Portions of the wall were discovered early this century at Parliament-square. This wall, said Dr. Miller, existed from the earliest period in the history of the town. Mr. Aitken then read a paper of his on the subject of "Modern Edinburgh," discussing the precise point at which James Craig, the pioneer in the planning of the New Town, commenced his work. The lecturer said the factually stated was that the first house erected was Rose-court, George-street, by John Young, and that it secured to him the premium of 20*l*. offered by the magistrates to whoever should build the foundation-stone being laid by Craig, on 26*th* 1767. Mackay, in his "Barony of Pughton," mentioned Thistle-court, and gave its date as 1766. In an early map, without date, published by Ainslie, which he stated was a copy one in the possession of George Paton of the Commons, and dedicated to Lord Provost Stewart, fixing it at the years 1780-81, the only houses were immediately behind St. Andrew's Church in the two- and two-story blocks still standing in Thistle-street, with gardens or forecourts separating them and numbered 1, 2, 3, and 4. Another authority stated that the first house built in the New Town was No. 1, in Thistle-street, next the Register Office. This might mean that it was the first erected in Thistle-street, for it was evident that priority date settled the question in favour of the Thistle-street house. The early houses in Thistle-street, it was said, had no doors to the thoroughfares, but were entered by common doors from the meuse lanes. This might quite have been the case. As Craig's plan called for no stables at the backs of the houses, the approach from that side would therefore be objectionable. The first part of the New Town begun was the eastward end, but in this respect occurred no buildings of any special character except Sir Laurence Dundas's house, which was designed by Sir William Chambers, and the corner blocks that flanked it in the New Town of St. Andrew-square. Of these two blocks, that to the north, it had been suggested, responded with the design in one of the rooms in the Soane Museum of a plan for Mr. Andrew Crosbie, advocate (the final of Playdell in "Guy Manning"), but the fact was that the columns and mouldings did not accord with those usually employed by Robert Adam, and indeed they were not good enough to be used, and it was moreover unusual for him to use an order rising at once from the ground, although his father, William Adam, did so, as might be seen at Hopetoun House and Airth. The most interesting and scholarly examples of the early phases of New Town architecture were to be found in the façades of Thistle-square, and it would be well if, in raising this, the proprietors jealously guarded the treasures from being tampered with, or if it necessary that alteration should be made, to see that it be done with the utmost good taste, and in a conservative spirit. There was no on any of the four sides which would not be a careful study; each side was arranged on a central block and wing system, and one point of merit was that the roofs, contrary to practice in Classic architecture at that time, were made to form a visible and agreeable part of the composition. On the motion of Mr. Robertson, seconded by Professor Baldwin Brown, a vote of thanks was given to Mr. Aitken for his paper. A similar compliment was paid to Dr. Miller. It was agreed, on the motion of the President, to record in the minutes the nation's sense of the loss sustained by the early death of Mr. Gray, curator of the Glasgow National Portrait Gallery.

ASSOCIATION. ARCHITECTURAL ASSOCIATION.—The annual monthly meeting of this Association held in the rooms, 114, West Campbell-street, 3rd inst. Mr. A. N. Paterson, M.A., in the chair, a paper was read by Mr. A. Graham on "Byzantine Architecture." A short historical sketch of the style was given, after which several

typical buildings were described, notably Santa Sophia and St. Sergius at Constantinople. Perhaps, said the lecturer, the most prominent characteristic of the style is the pendentive dome, and an account was given of its origin in Roman work and its adoption by the Byzantines, under whom it was perfected and made an integral part of design. The details of the style were illustrated by diagrams and plates, the lecturer concluding by referring to the adaptability of the style to modern requirements. A short discussion followed, and at the close a hearty vote of thanks was awarded Mr. Graham.

#### ENGINEERING SOCIETIES.

THE SANITARY INSTITUTE.—The ordinary general meeting of the Sanitary Institute was held on the 4th inst., at the Parkes Museum, Margaret-street, Sir George M. Humphrey, Vice-President of the Institute, in the chair. The annual report of the work of the Institute, together with the balance-sheet and statement of accounts, was received and adopted. Sir Thomas Crawford, Chairman of Council, said in reading the report that members would note with satisfaction that the work of the Institute had been carried on and extended with good results during the past year. He particularly referred to the lectures on the Sanitation of Industries and Occupations which had been delivered as a new departure in the work, and to the practical demonstration now given to students as part of their training for sanitary inspectors. The members and associates of the Institute at the end of 1893 numbered 1,319, and the income for the year amounted to 3,415*l*. The Duke of Westminster was re-elected President of the Institute. The meeting closed with the usual vote of thanks to the chairman.

LIVERPOOL ENGINEERING SOCIETY.—The eleventh ordinary meeting of the session of this Society was held on the 4th inst., Mr. Coard S. Pain, A.M.Inst.C.E., in the chair, when a paper, entitled "Some Methods of Regulating Pressure in Electric Light Circuits," was read by Mr. Wilfrid S. Boulton, A.M.Inst.C.E. After pointing out the necessity for very exact regulation of pressure in currents running incandescent lamps, owing to the greatly-enhanced variation of light due to a small variation of pressure and the quick destruction of the incandescent filament if a large excess of pressure takes place, the Board of Trade limitations were given, and the question was then considered under the following heads:—Irregular speed of engine; varying terminal E. M. F. of dynamo with varying load; varying loss of E. M. F. in feeders to mains with varying load; varying loss in mains, service lines, and house wiring. Numerous diagrams were exhibited, illustrative of the various apparatus and methods described in the paper, which was stated to be written more for the purpose of affording to non-electrical engineers a general insight into the present state of the question than with the object of being interesting to the electrical expert.

### Correspondence.

To the Editor of THE BUILDER.

#### CHURCH OF ST. JOHN, DAMASCUS.

SIR,—I thank Mr. Spiers for considering so carefully the suggestions I put forward in regard to this church, and for joining in the attempt to define its ancient form.

In endeavouring to follow what would be the consequences of Mr. Spiers' present suggestion it is necessary to have a clear view of the plan of the whole mosque; possibly that in the *Builder* for March 17 may serve if it is remembered that the two wings are exactly alike, and that each is made up of three rows of columns, and a wall to the south, the north side being formed by one of the rows of columns.

Of this building certain parts appear to me Early Byzantine: the centre of north front with entrances, the window above, and the pediment making up the gable end: the arched centre, including the niches across the angles of the lantern: the south wall and gable.

In thus considering the whole of the centre block Byzantine, I agree with Choisy and Professor Lewis, but both these writers believe this part to be a transept. Professor Lewis says ("Holy Places")—"This was, I have little doubt, the transeptal part of the great church said to have been rebuilt by Arcadius c. 395." I shall call the two plans now suggested A and B, as it is more easy—if I have to oppose—to oppose an abstract proposition.

Scheme A suggested that we had in the central part nearly the whole of a church of Byzantine, pier and arch, construction; that it was symmetrically placed in a great court; how it was related to previously-existing work; and how it might have been easily extended to form the present mosque.

Scheme B.—Mr. Spiers now agrees that it is difficult to believe that the centre was a transept, and gives up this part altogether. Of two similar wings, one is to be chosen—which one is uncertain—then, out of its three rows of similar columns at equal distances apart, two rows are to be selected; then, discarding one row and adding two other rows, four colonnades are obtained, and a basilica may be designed to contain them.

With the abandonment of the centre, every positive claim is given up, even the two rows of columns which are to be selected out of six are said to be Roman (see February 17). I will, however, show some of the consequences of entertaining scheme B.

a. Either the great courtyard must go with the centre building, or the church was absolutely in the corner with its entrances, narthex, and atrium external to this court.

b. In the transformation to the wing of a mosque the basilica was virtually destroyed for the sake of altering a five-aisled building into a three-aisled building when other mosques have more than five aisles, that of Jerusalem, as completed by Walid's father, having at least twice as many.

c. The suggestion that any columns weeded out furnished those for the other wing would account for little, because the north wall was (by hypothesis) taken down at the time when the extension was made, and was replaced by arches on similar columns.

d. The central portion, if a part of the reconstruction, was built against the transformed wing, so that its clearstory windows were half blocked by the roofs of the wing. Now we often find extensions blocking up windows previously existing, but this would be difficult to understand in buildings that are contemporary.

e. The rows of columns giving five unequal spans were so placed (we should have to suppose) that when two were removed three equal spans resulted.

f. The centre, together with a second wing copied from the altered one, and of the same length, made up an exactly symmetrical composition, and yet happened to fit the side of the courtyard exactly. This, with a, is too much to accept, and the courtyard must also be a part of the rebuilding if we adopt scheme B.

Referring to the original suggestions—1, I still think basilica B excessive for an Eastern church. It is said, however, that it might be a copy of the basilica of Jerusalem in form and size, but the form of the latter is probably the most problematical problem in Christian archaeology, and its size is entirely unknown. I do not understand Mr. Spiers' dimensions of Bethlehem. The five-aisled nave is 87 ft. east and west by 75 ft. north and south; width of centre span, 34 ft. 3. Galleries, I admit, were not universal. 6. It is not the blocking of windows in dome to which I referred, but those of the clearstory of centre part, by roofs of the wings; see d above. 7. The canopy of the fountain is Arab, but the fountain itself I believe is not; granted scheme A, it comes exactly where it should be for the church. I cannot see any difficulty in constructing a dome of 45 ft. span at any time between the building of the Pantheon and Sta. Sophia; but I am not concerned with the dome, as I believe the present one to be Arab, and said of the former covering, (following the Isaurian Church) "dome or lantern." The niches, however, are very characteristic, and I look on them as types of transition, in this following Choisy.

As to the orientation, at a time of transition from a westward to an eastward direction, neither can be said to have been a rule. Nor, as I have before shown, was the choice confined at this time to the two. A church at Khoreisa was entered at the north, and had its apse, which appeared only on the inside, to the south (see "Survey W. Palestine," II., 356.) At Umm Keis a basilica stands exactly north and south, with an apse to the interior only. (Schumacher's "Ajlun.") The early churches in Rome box the compass; and those of Constantinople vary from the east-west direction by 30 or 40 deg.

Two points further. 11. Above the ancient Roman doors, and on the south wall of the centre block is placed an Early Christian inscription, "Thy kingdom, O Christ, is an everlasting Kingdom, &c."



12. Mukaddasi (985) names and describes the gates of the mosque. Two are clearly those into the court from the east and west. Then follows a third "in the eastern angle of the covered part of the mosque." "The fourth gate is called Bab al Faradis (gate of the gardens). It is opposite the *Mihrab* (south centre), and opens into the arcades between the two additions, which have been built here on the right and on the left; above it rises a minaret." Mr. Le Strange (see "Pal. Pil. Text") suggests that this gate is the small one entering the court on the north, but allows that it is not clear. Possibly the Paradise might be explained by a reference to the atrium court of Old St. Peter's, which bore this name. I suggest that the gate opposite the *Mihrab* is the central entrance of covered part, the most important of the doorways, inside which the water vessels are placed (the minaret above is the only difficulty—possibly read, "in front of"). "The additions which have been built on the right and left" would then be the two (Arab) wings. I do not offer this last as a proof, but as a conjecture which might become available if scheme A is accepted.

W. R. LETHABY.

#### "REDECORATION OF THE CONSERVATIVE CLUB, ST. JAMES'S."

SIR,—My attention has just been drawn to the article upon the above subject in your issue of March 31. In this article there are numerous errors which I trust you will allow me to correct. My father, Mr. Frederick Sang, decorated the Conservative Club in 1845. His work at the time gave the most perfect and entire satisfaction to the eminent architects, the late Messrs. Smirke and Basevi, and also to the members of the club. Since that time the work has so often been restored that my father's original designs and colouring had entirely disappeared. The fiasco made in 1892 arose from employing a firm of linendrapers and furniture dealers to do artist's work. The veined marble with which the walls of the lower hall were lined was of the cheapest sort,  $\frac{3}{4}$  in. thick, and infamously put together. The work was not carried out by Italians, but was done by cheap Belgian labour. I am surprised that any architect could have sanctioned such bad work. Upon the last special decoration committee there were three eminent architects and one well-known artist. The lower hall only was redecorated by my father, and was carried out after the original drawings made in 1845, the only addition introduced being gilding. The upper hall and ceiling of grand staircase were done in 1892 by the above-mentioned firm, so they are answerable for the dirty, "muddy yellows," &c., &c. The lower hall, just completed by my father, is in the Cinque-Cento style, and not "Modern Italian," as your critic says. The ("supposed") portraits of poets and painters are taken from the best sources, and were carried out by a clever portrait-painter. The work was not done by artists from Munich.

Regarding the Raphaelianesque, everyone to his taste, but I must say that an artist could not do better than to take the great master Raphael as an example. This style is also perfectly in keeping and harmony with the style of the building. I do not know if your correspondent noticed the stained glass windows in the grand staircase. These windows are almost pure Gothic, and were done in 1892 by the same firm who did the marble work and muddy yellow painting.

HENRY H. B. SANG,

Architecte-Décorateur.

(Élève de l'École des Beaux-Arts, Paris.)

April 6, 1894.

#### ADMIRALTY EXTENSION BUILDINGS HEATING AND VENTILATING CONTRACT.

SIR,—The London Building Trades Union officials having interfered with my men on the pretext that they are working more than nine hours *per diem*, but really because they do not belong to the "Union," will you kindly allow me to state the following facts for the benefit of those interested. The rate of payment for skilled fitters is 9s. 6d. to 10s. per hour. That for labourers is 6d. per hour. Expenses are allowed at the rate of 1s. per week per radial mile from works, with a maximum of 5s. per week. The men commence at 7 a.m., and leave at 5 p.m. Out of this time, one hour is allowed for dinner and paid for by me.

JOHN JEFFREYS.

#### LOWESTOFT SCHOOL BOARD COMPETITION.

SIR,—Notwithstanding the words in the advertisement inserted in your paper by the Clerk to the above Board—"The designs and plans . . . will be submitted to, and the Board advised upon their respective merits by, a competent architect"—I read in the *Lowestoft Journal* of the 7th inst. that "the General Purposes Committee have been almost at

their wit's ends to know which to select, and as a last resource, one bewildered member has suggested that to the public shall be delegated the task of choosing."

Does this mean that the Board has forgotten the terms of the advertisement by which they have induced twenty-eight architects to make a large expenditure of time and money?

"SQUARE."

#### FLETTON BRICKS.

SIR,—There is one error in the letter you printed from "A Lover of a Good Brick" which ought to be corrected. He says our bricks are made from "Kimmeridge clay." Now any geologist will tell you that Kimmeridge clay does not exist at Fletton, nor within many miles of it.

HICKS, GARDENER & CO.

### The Student's Column.

#### THE STRUCTURE AND PHYSICAL PROPERTIES OF BUILDING STONES.—XV.

##### 2.—THE PORTLAND DISTRICT.

THE following sketch map (Fig. 20) shows the positions of the various quarries in this district, all of which we visited. The



FIG. 20.—Geological Sketch Map of the Isle of Portland, showing sites of Stone Quarries.

geological formations outcropping in the island, in descending order, are as follow:—

**Purbeckian**—(Vertical shading on map), covering about one-half of the area, but very superficial.

**Portland Stone**—(Vertical dotted lines), forming the hard surface from north to south.

**Portland Sand**—(Irregular dots), not seen in the quarries.

**Kimmeridge Clay**—(Horizontal lines), underlying the whole, and forming the gentle slopes on the northern side of the island.

All the beds dip to the south at a low angle. It may be noted that quarries are distributed more or less over the whole of the northern half of the outcrop of the Purbeckian and Portlandian beds, and many workings are so close together that they might be regarded as one gigantic quarry. In this area, as in some others to be described in a later article, the term "quarry" is difficult to diagnose, being, in fact, occasionally synonymous with a "gang of men." The figures in the above map, therefore, do not represent the sites of all the quarries we visited (which must have numbered at least one hundred separate workings), but denote points of special interest calculated to assist in elucidating the structure and physical properties of the whole of the materials known as Portland stone.

#### General Structure of Portland Stone.

There are three recognised kinds of Portland stone available for building purposes—(1) Roach, (2) Whitbed, and (3) Basebed. The first two are normally joined together as one bed, there being no horizontal joint or bedding plane between. The line separating them for com-

mercial purposes is drawn by the quarryman, and it is no uncommon thing to find a part of the former "accidentally" joined to the latter, as the Roach is not so valuable as the Whitbed for building. The beds are superimposed in the order given, namely, the Roach is above the Whitbed, and that is above the Basebed. As a guiding principle, it may be taken for granted that the most distinctive structural character of the Roach is the presence of holes, sometimes rather large, from which fossil shells have been removed by the percolation of acidulated water; while shells remain are mostly large, also, but the general structure of the finer-grained parts of the Roach, between the fossils, is very similar to that of the Whitbed. The latter contains much shelly matter in its upper part, which decreases in corresponding ratio from above downwards, so that its base is practically free from organic remains so far as can be ascertained by the naked eye. The Basebed contains little or no visible shelly matter, very small quantities only being apparent, even with a lens. Broadly speaking, therefore, the Roach is seen to contain the remains of large shells in abundance; the Whitbed, as a whole, smaller ones; and the Basebed, hardly any. Excluding the Roach, as not being so extensively employed, by reason of its vesicular structure (though it is an exceedingly durable material), we should say that, in addition to relative abundance and size of shells, the Whitbed is of a light brownish tint, whilst the Basebed is almost white.

Now, hitherto, we have dealt with the general features of the broad structure of Portland stone, but these are somewhat complicated in districts where more than one Whitbed appears, or where the Roach is duplicated, or the Basebed "runs bad." Here it is that the architect would find some difficulty in recognising the beds *in situ*. It will be understood that as only the three kinds mentioned are known by name in the market, all varieties of building stone found in the island have to fit into one or other of these for commercial purposes, no matter whether they approximately correspond to or widely deviate from the types *sensu stricto*. But we must not pursue this subject further lest we be misunderstood; our only object is to enable the architect, when ordering a definite kind of stone, to be sure, on scientific grounds, that he gets it—a matter of some uncertainty at present, in many instances.

#### Micro-Structure of Portland Stone.

There is a general resemblance in the micro-structure of all the varieties of Portland stone, but they can, nevertheless, be readily distinguished from each other by certain generic characters. For instance, the Basebed always contains quartz grains rather plentifully, in the Whitbed these are not so abundant, whilst in the Roach they are practically absent. We make a slight reserve for those abnormally developed beds duplicated in certain districts where the so-called Whitbed has as much free quartz as the Basebed. It is curious, although not difficult to account for, that the microscope shows the relative distribution of shelly matter in a contrary manner to that observable with the naked eye. For, whereas the Roach contains a great number of large shells, as already stated, its micro-structure between these shells indicates hardly any fragments of the same; the Whitbed has a slightly larger proportion of minute shells; but the Basebed, which as we know, rarely has any clearly discernible shells, is seen under the microscope to be very largely made up of minute shell fragments, and other organic remains.

Other distinctive micro-characters of Portland stone are the uniformity, or otherwise, of the oolitic granules, the state of alteration of these, and the presence or absence of matrix.

Comparing the micro-structure of the Portland stones of the Isle of Portland with that of the Purbeck-Portland group (with which they are sometimes confounded by architects), described in our last article, we find that the disposition and condition of the oolitic granules are practically identical in both groups, but there are, nevertheless, certain distinguishing features, viz.—the matrix in the Purbeck-Portlands is fairly abundant, its calcite being clear and showing lines of cleavage; but the true Portland stones have either no matrix at all, or but very little, sparsely developed, and not too clearly defined, certainly the Purbeck-Portlands contain many more free quartz grains than any of the true Portlands; in the latter they exist chiefly as the nuclei of oolitic granules, in the former mixed up indiscriminately with the other constituents of the



one. The structure of the true Portland beds varies slightly with their geographical position. We will now describe in detail a typical micro-section of each kind of Portland stone, commencing with the Basebed (fig. 21). The specimen selected for illustration came from



FIG. 21.—Micro-structure of Portland Stone—Basebed. (Wakeham quarries.)  
a = Quartz grains. b = Fragment with cells. c = Flinty granulated matrix.

the well-known Wakeham quarries. We notice at this in a mass of a large number of oolitic granules, with shells and other organic remains, partly adhering to each other, and partly also undetached by matrix. The oolitic granules are very distinctive, quite different to those found in the Bath, Ancaster, Ketton, Weldon, or other oolitic limestones. They are mostly very hazy, seem to have been much decomposed at the period of their existence, but were arrested from finally being removed, or broken up; subsequently they became hardened, until now we find them so hard (and in a measure crystalline) at the durability of the material is entirely governed by them. After the manner of the Basebed in general, but very little matrix is present, and that is distributed in local patches shown in the figure towards the middle and bottom (c) of the section. It is fortunate for the stone that this matrix is not only very crystalline, but is silica, really granulated flint, and tends towards its general preservation. A chemical analysis of the sample, however, would yield a much higher percentage of silica than is found in the matrix merely, for we see that many quartz grains (a) occur as the nuclei of oolitic granules, and which do not assist the stone in resisting the action of the weather in the slightest degree. An analysis would show that 2.5 per cent. of silica, of which only about 1 per cent. is matrix—not a very valuable help, but better than nothing, or calcite. The student will notice a number of shell fragments and other organic remains (b), the abundance of which is peculiar to the material, as compared with other Portland beds.

Passing now to the micro-structure of the Whitbed, we select a typical specimen for illustration (fig. 22) from Tout quarry, in the north-

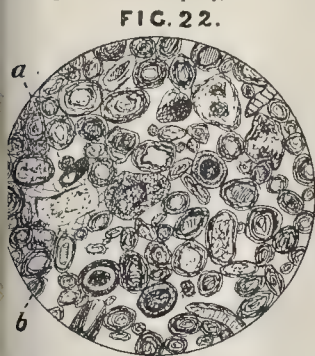


FIG. 22.—Micro-structure of Portland Stone—Whitbed. (Tout quarry.)  
a = Quartz grain. b = Local patches of flinty matrix.

east of the island, where a very large amount of material has been removed. It differs from

the Basebed in having the oolitic granules farther apart, by the comparative infrequency of quartz grains (a), and the paucity of organic remains. Further, the oolitic granules, although still rather hazy, possess more structure; they do not seem to have been so much affected by what may be called "primary decomposition," and are more crystalline in nature. As in the Basebed, local patches of granulated flinty matter (b) occur, binding together a few of the surrounding constituents of the stone, but there is no matrix, properly so-called. Four quartz grains are visible in the section under consideration, all existing as nuclei of granules; this number is in excess of the average quantity in the Whitbed, where we sometimes search over a whole micro-slide before detecting even one such grain. The great strength and durability of this material lies in the highly crystalline nature of its calcitic, oolitic granules, and the firmness of their adhesion to each other.

The specimen from which the micro-section of Roach about to be described was cut came from the Toutfield quarries. The student will understand that we are only able to refer to the structure of the finer parts of the stone, owing to the vesicular character of the remainder. Comparing it with its nearest ally, the Whitbed, we note a still further decrease in the number of quartz grains; the oolitic granules are about the same, but we can detect no flinty matter, although there is some evidence of a matrix in several parts of the stone. Here and there minute calcite veins run through the material; the oolitic granules are locally congregated so closely together, and fit so tightly as to suggest a species of concretionary structure. The micro-structure of the Roach passes insensibly into that of the Whitbed, as might be surmised from what has already been said.

Three other hard limestone beds in the island, but of no value for building purposes, are known respectively as the "Cap," "Skull Cap," and "Curf." To prevent confusion with the other beds, it is only necessary to say that the micro-structure of the Cap and Skull Cap shows them to be full of minute punctures, or deep holes, whilst the oolitic granules are very much smaller than in any of the building stone series; there is more matrix, and that is calcitic, quartz being practically absent. The Curf is finer even than the Skull Cap; it has more matrix, its oolitic granules are not so distinct, and the stone generally is more quartzose.

#### GENERAL BUILDING NEWS.

RUTHERFORD COLLEGE, NEWCASTLE.—The Duke of York opened the new Rutherford College of Science and Art, Bath-lane, Newcastle, on the 5th inst. The architects of the new college are Messrs. Oliver & Leeson, of Newcastle. The new college faces Bath-lane, and has a frontage of 120 ft. There are basement, ground floor, and first, second, and third floors. On the basement are dining rooms for boys and girls, metallurgical laboratory, &c. On the ground floor is the large examination and assembly hall, 63 ft. by 40 ft. This has a gallery and a platform. There are also, on the same floor, a physics lecture room; a second physics lecture room, a physics laboratory, a preparation room, a small optical room, master's room, lavatory, and cloak room, &c. On the other side of the corridor, there are a committee room and registrar's room on one side of the lobby, and on the other side, a library and reading room. The assembly hall and physics lecture room run up through the first floor, the gallery being on a level of the first floor. There are, besides, on the first floor, six class-rooms. On the second floor the central space is occupied by the lights of the assembly hall. On three sides of this are the following rooms:—Still life room, antique room, master's room, general cast room, model drawing room, and an elementary art room. On the other side of the corridor are:—Modelling room, building construction room, machine construction room. On the third floor are the following:—Chemistry lecture preparation room, chemistry lecture theatre, two small dispensaries, teacher's room; elementary chemistry laboratory, 116 ft. at its greatest length, and 31½ ft. at its greatest width; balance room, honours chemical laboratory, organic combustion room, biology preparation room, physiology preparation room, and a physiology and biology laboratory. The tower will be used as an astronomical laboratory. The whole contract for the building was given to Mr. Alexander Pringle, of Cramer Dykes, Gateshead. The clerk of works was Mr. David Campbell, and the heating engineers were Messrs. Ashwell & Nesbit, Leicester and London. The ventilation is on the Plenum system.

PROPOSED ISOLATION HOSPITAL, DORCHESTER.—A Local Government inquiry was held at Dorchester on the 29th ult. by Mr. H. Timbrell Bulstrode, M.D., respecting an application by the Town Council for sanction to borrow the sum of £500, for the erection of an Isolation Hospital for the

borough. A site, one acre in extent, has been purchased from the Duchy of Cornwall, about a mile from the town, and a quarter of a mile distant from the nearest dwelling-house. The accommodation now proposed to be provided comprises a ward pavilion, containing two double-bedded wards and nurses' room; a caretaker's cottage, with bedrooms for nurses and attendants, and the usual outbuildings. In addition to the foregoing, provision is made in the design for the erection of a second ward pavilion, containing similar accommodation, should it be found necessary. The plans were explained in detail by the Borough Engineer and Surveyor, Mr. G. J. Hunt, who is the architect for the works. At the close of the inquiry, the Inspector visited the proposed site, to which considerable opposition had been offered at the meeting.

METHODIST CHAPEL, WREKENTON, DURHAM.—The foundation-stones of a new chapel at Wrekenton were laid a short time since. The main entrance to the building will have an outer porch, with folding doors to an inner vestibule leading to the chapel, which will be 36 ft. by 24 ft., with a class-room or vestry at the rear, 16 ft. by 12 ft., under which is placed the heating-chamber, &c. An entrance is provided on one side, communicating with the class-room and the chapel, which will serve as an exit at the rear. The style of architecture is Gothic, and the chapel is built of Birtley bricks with stone dressings, relieved with red bands, quoins, and string courses, &c. The main feature is the front gable and entrance porch, both of which have overhanging ornamental barge boards. The contract for the whole of the work is being executed by Mr. Isaac Bewley, builder, of Dunston, from the designs of Mr. John W. Firth, architect, Oldham.

CHURCH, MARSDEN, YORKSHIRE.—The foundation-stones of a new church for Marsden were recently laid. Mr. C. Hodgson Fowler (Durham) and Mr. J. Kirk (Huddersfield) have drawn plans of a church in the fifteenth-century Perpendicular style. Tenders for the carrying out of the full design came to about £11,000, but in the present scheme only a nave, aisle, and porch will be erected, the contracts amounting to £7,500. The church is being built on the original site on the south side of the river Colne.

MISSION CHURCH AND SCHOOLS, ST. HELENS.—The memorial stone of the new mission church and schools, which are being erected at Cowley-hill in connexion with the parish of St. Helen's, was laid recently. The total cost of the schools will be a little over £8,000, and they are designed for 400 boys and 400 girls of the upper standards. The scheme contemplates the use of the buildings as a mission church, and a large chancel is included in the plans on the ground floor, which will be screened off entirely through the week, and thrown open on Sundays. The mission church will accommodate over 700 people. The work is to be completed in eleven months. The architects are Messrs. Willink & Thicknesse, Liverpool, and the contractor is Mr. Whittaker, of St. Helens.

PROPOSED RESTORATION OF GRINTON PARISH CHURCH, YORKSHIRE.—At a recent meeting of the parishioners of Grinton-in-Swaledale, it was decided to restore the Parish Church of St. Andrew, and the plans submitted by Messrs. Hincks & Charleswood, architects, of Newcastle-on-Tyne, were accepted. The work is estimated to cost some 2,000l.

VICTORIA INSTITUTE, WORCESTER.—On the 3rd inst., the Duke of York laid the foundation-stone of the Victoria Institute, Worcester. The architects are Messrs. J. W. Simpson and E. J. Milner-Allen, of London, whose designs were selected in open competition by Mr. Waterhouse, R.A., the assessor. Messrs. Wood & Son, are the builders.

BOARD SCHOOLS, SHARROW LANE, SHEFFIELD.—The new junior mixed department which has just been added to the Sharrow Lane Board Schools was opened on the 9th inst. The buildings which already occupied the site consisted of schools for boys, girls, and infants; the new department is a mixed school for junior boys and girls. The design of it harmonises with the older schools. The architect has raised the building on pillars, so as to get covered playsheds below, and not only has the extent of the playground thus been preserved but better lighted rooms have been obtained. There are four class-rooms, each for 60 scholars, and the central room will accommodate 200 more. All the class-rooms can be overlooked by the head teacher from the central room, and two of the rooms can be opened by the manipulation of the single action sash partitions originally invented by the architect of the school. There are rooms for teachers and the necessary stores, cloakrooms, and lavatories. Messrs. Newton Chambers & Co., Limited, have supplied the heating apparatus, which is on the low pressure principle, worked by one of their "Kingston" patent boilers. The contractor for the whole of the building works was Mr. John Greenwood, of Attercliffe; the asphalt of the yards was done by Mr. John Hadfield, of Ellesmere road; the clerk of the works was Mr. E. Cartwright; and the architect was Mr. C. J. Innocent, of Sheffield.

PROPOSED RENOVATION OF ALL SAINTS' CHURCH, NORTON, NORTHAMPTONSHIRE.—All Saints' Church, Norton, a church of the fifteenth century, is about to be renovated. The interior of the edifice is to be cleaned, and the old-fashioned straight-backed pews are to be taken out, and to be



replaced by pews of a more modern date. The flooring of the church is to be improved. Mr. R. Armstrong, of London, is the architect under whose supervision the alterations are to be made; and Messrs. Neal & Bosworth, of Davenport, are the builders.

#### STAINED GLASS AND DECORATION.

**WINDOWS, ALL SAINTS' CHURCH, PLYMOUTH.**—Four large single lights in the apse of this church are now filled with painted glass. They represent patron saints of some of the guilds of the parish. The figures are very large, standing upon simple bases and under canopies with quarry work at top and bottom. They are the gift of the vicar, Rev. C. R. Chase, and were executed by Messrs. Percy Bacon Brothers, of London, after suggestions by Mr. Edmund Sedding, architect, of Plymouth.

**MEMORIAL WINDOWS, RUSTINGTON, SUSSEX.**—On the 24th ult. two memorial windows, recently placed in the Parish Church, Rustington, were dedicated. One of the windows, executed by Messrs. Ward & Hughes, London, portrays the renunciation of St. Elizabeth of Hungary. The subject of the other window is the Virgin and Child.

**WINDOWS, SALISBURY DIOCESAN HOUSE OF MERCY.**—Three painted windows from the studio of Messrs. Charles Evans & Co., London, have been placed in the apse of the Chapel of the Salisbury Diocesan House of Mercy, erected as a memorial to the late Hon. Christopher P. Bouvier. Representations of the Virgin, Isalah, and St. John the Baptist are introduced, and the arms of the Diocese and various emblems are shown in the ornamental portion. Mr. G. Hamilton Gordon was the architect.

**WINDOW, KILTEGAN CHURCH, LIMERICK.**—A painted window from the studio of Messrs. Charles Evans & Co., London, has just been placed in Kiltegan Church, co. Limerick, by Mrs. Langrishe and Mrs. Keill-Falkner in memory of their father. Representations of the Evangelists are introduced in the lights, and the window has the following inscription:—"To the Glory of God and in memory of the Right Hon. W. W. F. Hume-Dick, Q.C."

**MEMORIAL WINDOW, FREE METHODIST CHAPEL, SHEFFIELD.**—A new stained glass window to the memory of the late Mrs. Wardlow, which has been placed in the front end of the Surrey-street Free Methodist Chapel, Sheffield, was dedicated on the 9th inst. The renovation and redecoration of the chapel has also only just been completed under the direction of the architect, Mr. C. J. Innocent. The gallery pewing has been remodelled and modernised, and the pewing under the galleries has been made like that in the centre of the chapel. A panelled dado has been placed round the interior and new staircases have been fixed at the entrances. The old wooden columns to the galleries which were giving way have been removed, and iron columns substituted. By arrangement with the adjoining owners the blank windows on the side next to the music-hall have been opened both upstairs and under the galleries. The stained glass window is a large square one, and represents the three Marys going to the tomb early in the morning on the day after the Passover and finding the angel clothed in white seated on the tomb. The work has been executed by Messrs. John Hardman & Co., of Birmingham, under the direction of Mr. Innocent, the architect. A new warming apparatus has been put in by Messrs. Truswell & Sons on the high-pressure system. The premises have been painted and decorated by Messrs. Johnson & Appleyards. The repairs and alterations have generally been carried out by Messrs. W. & A. Forsdike.

#### FOREIGN AND COLONIAL.

**FRANCE.**—The Société Nationale des Beaux-Arts (the Champ de Mars Salon) has refused to take any part in the Antwerp Exhibition in consequence of the refusal of the managers of the exhibition to give them an equal place on the jury with the representatives of the Old Salon. It is announced that henceforth the hours of opening of the Louvre and Luxembourg Galleries will be from 9 to 5 instead of from 10 to 6 as hitherto. The hours of the Cluny Museum will also be extended to 5 o'clock. The jury of the Champs Elysées Salon has received 1,862 pictures and 686 drawings, pastels, and miniatures. The Gare du Nord, Paris, is shortly to be enlarged. A committee, presided over by M. Carolus Duran, has been formed with the object of erecting a monument in honour of Watteau in the Luxembourg garden. The Académie des Beaux-Arts has just been deciding on the results of the work sent for the Duc prize, which has not been awarded in consequence of the insufficient merit of the designs sent in. The competition has been cancelled and adjourned to another year. The Minister of Public Instruction has commissioned M. Théophile Polpoit, author of various well-known panoramas, to paint a large picture for the museum at Versailles representing the scene of the loss of the *Vengeur* battleship. M. Albert Ballu, the architect, has been commissioned to rebuild the celebrated Café Riche, at the angle of the Boulevard des Italiens and the Rue le Pelletier. The new building, which will be of the most luxurious type, will include some important decorative work to be carried out by

MM. Felix Barrias, Doucet, and Guillaume Dubule, as well as some large mosaics by M. Facchina after cartoons by M. Forain. The "Société Académique d'Architecture" of Lyons has opened its annual architectural and archaeological competition. For architecture it has given as subject a Hôtel for the military Governor-general of Lyons and his Staff. For the archaeological competition the subject is the City of Lyons in 1550, including the plans of various important buildings of that date. Twenty-two designs have been sent in for the competition for a museum and library at Périgueux. The first premium was given to MM. Planckaert, and Godefroy de Linoges, who will carry out the buildings; the second to M. Legrand of Paris, and the third to M. Erard, also of Paris.—The Société des Arts at Valenciennes has started a scheme for an annual art exhibition, to be held every September. The death is announced of M. Eugène Abot, the engraver, an excellent artist equally as engraver and etcher. He executed various fine plates for the *Gaule des Beaux-Arts*. He made also a number of illustrations for the works of Flaubert, and for the "Inferno" of Dante. He exhibited two engravings in the last Salon. The jury of Ecole des Beaux-Arts has decided on the competition of students of the first class in architecture. The programme was a Palais de Justice. Medals were awarded to Messrs. Sirot, Bernard, and Prudon. The jury of architecture at the Salon this year will consist of MM. Daumet, Coquant, Ginain, Vaudremer, Pascal, Guadet, Mayeux, Laloux, Loviot, Garnier, Raulin, and Corroyer, with M. Esquie and M. Deslinières as supplementary members.—It is proposed to utilise the Pavillon de Flore at the Louvre for the organisation of a Fine Art School for female artists (painters and sculptors).

**GERMANY.**—On January 1 the German *Architekten Verein* numbered 1,822 members. During the year another 4001 has been paid off the debt incurred by the building of the *Architekten-Haus*, whilst the benevolent fund has been enriched by 3,500. Under the will of the late Herr Richter. The library now contains 11,930 volumes. The Verein is at present engaged on a new edition of "Berlin and its Buildings," in conjunction with the *Vereinigung Berliner Architekten*, which is to be ready in 1896, in time for the contemplated general gathering of the Associated German Architectural and Engineering Societies at Berlin.—The directors of the Wilhelma Insurance Company of Magdeburg announce a competition for the designs of a new building for the use of the company. The sum of 22,000 is not to be exceeded. Three premiums will be given, of the respective values of 500, 1,000, and 750, whilst other designs may be "bought" for 250. The jury comprises the following architects:—Messrs. Wallot (Berlin), Hossfeld (Berlin), Licht (Leipzig), and Peters (Magdeburg).—The premium for the designs of a Columbus monument at Lehe, near Bremerhaven, has been awarded by the jury (the professors of the Munich Academy of Art) to Ludwig Habisch, of Darmstadt, who has been entrusted with the carrying out of the work.—A special feature at this year's Berlin Art Exhibition will be the decoration of the central halls, undertaken under the direction of architect Hoffacker.—Excavations near Cannstadt, in Wurtemberg, have led to the discovery of a large water, dating from Roman times, the walls of which are of a fine redness, and are maintained to a height of about 4 ft. This is the first Roman military work, unconnected with the *Limes*, hitherto discovered in Wurtemberg.—The foundation stone of the Berlin Cathedral will probably be laid by the Emperor in the commencement of June. During the second half of 1893 over 14,000 cubic metres of earth were carted away, and 4,600 cubic metres of the old foundations removed. It is expected that the vaults and the greater part of the works on the ground level will be completed during the course of this year.—Work is rapidly progressing on the Emperor Frederick Memorial Church in the Thiergarten, under the direction of Herr Leibnitz, with a view to its completion next year. 22,000, of a total of 27,000, has still to be subscribed towards the cost.—The Society for the Extension of German River and Canal Navigation has presented a resolution to the Government in favour of Herr Messerschmidt's project for a canal to unite the Rhine, Weser, and Elbe. The proposed canal would be about 150 miles long, involving a cost of nearly 12,000,000.—The recently-completed lock on the Spree at the Mühlendamm has taken three years to build. It is 350 ft. long by 31 ft. wide, and can be filled in two minutes, the doors and sluices being worked by hydraulic pressure supplied by the neighbouring weir.

**ITALY.**—There is to be an international Art Exhibition at Rome under the auspices of the Art Union, to commemorate the twenty-fifth anniversary of the entry of the Italian troops into that city.

**BELGIUM.**—A harbour is projected at Heyst in connexion with the port of Bruges. The scheme has been submitted for consideration to several English dock engineers.—At the Antwerp Exhibition, in addition to the "Old Antwerp" street, there will be reproductions of a ruined Rhinish castle, a Syrian bazaar with mosque and seraglio,

the Vienna Prater, a complete Tunisian square, and a miniature Eiffel Tower. Most of the houses of "Old Antwerp" are already completed, and are being let at rents varying from 150l. to 800l. The 15th inst. was the last day on which works would be received. Sir Frederic Leighton has, we understand, promised "Old Antwerp" and the "Garden of the Hesperides." In connexion with the exhibition there is to be a competition for the designs of a barrack to suit the climatic conditions of tropical Africa. In addition to the premiums to be awarded by the jury, the Congo and African Red Cross Society announce that they will purchase the design placed first for 4,500 fr. Further particulars may be obtained from Baron de Bethune, 4, Place du Trône, Brussels.

#### MISCELLANEOUS.

**BRIDGE, SEATON SLUICE, NORTHUMBRIA.**—A new bridge spanning the valley at Seaton Sluice has been opened for traffic. The new bridge, which has been about eleven months in course of construction, consists of one arch only. This has a 50-ft. span, and the height from the bed of the stream beneath to the roadway above is about 33 ft. The parapet is nearly 4 ft. in height. There are two approaches, one from the north which joins the Blyth turnpike at the top of Lodge Bank, and the other joins the Shields turnpike near the Melton Constable Inn, at Seaton Sluice. The length of the bridge is 150 ft., and the entire new roadway formed in connexion with the approaches is about 430 yards long. The roadway of the bridge is 24 ft. wide. There is a footpath from 6 ft. to 7 ft. wide at the east side of the bridge, and this path extends along the entire length of both the bridge and the approach. The structure stands on a cement put on the highest level of the soil. It is throughout of stone worked from the old quarries at Seaton Sluice. The haunches are of cement concrete, the arch of ashlar stone; the abutments and wing walls are of sneaked ashlar, and the parapets of dressed ashlar. The contractor and builder has been Mr. W. T. Weir, of Howdon-on-Tyne, and the engineer is Mr. John Waters, Surveyor to the Highway Authorities, who has had the supervision of the work, assisted by his inspector, Mr. Thos. Maughan, of Whitely.

**DRIp LUG FOR RAIN-PIPES, &c.**—This, known as "Baker's patent drip lug," and patented by Messrs. Baker & Vickers, consists of a projecting lug cast on or fixed to the pipe, spreading out into a flat piece with nail-holes for attachment to the wall; the object being to fix and firmly support a rain-spout or soil-pipe so far from the surface of the wall as to clear ordinary projections of stringcourses or plinth, and to keep any overflow or leakage water from running down the wall, thus minimising the mischief from these causes. A double lug at right angles is made for fixing spouts in angles of a building. The device is simple and useful.

**DRAWING MATERIALS.**—Messrs. E. Wolff & Son send us their pencil beam compass, which it is a mistake to describe specially, as they do, as "a really reliable instrument," as if other beam compasses were not reliable. Its special merit is that it is very cheap and light, easily carried about, and will do a good deal of ordinary work for moderate-sized circles as well as a more costly instrument. It consists of two rods about the size and appearance of ordinary pencils, which can either be used separately or be united into one by a metal ferrule connecting them. The needle-point and the pencil-holder are attached to two similar slit ferrules, which can be slipped on at opposite ends of the stick, and can be pushed backward or forward as required for the radius. Nicety of adjustment of radius would not be very easy, but the small instrument will be useful for occasional work where no great nicety of adjustment is required. By reversing the working pencil in its socket, a penholder is formed in which an ordinary nib may be placed and circles described with it. The patentee is Mr. J. P. Magnin, who also sends us a diagram of a T-square attachment for converting a fixed head into a movable head so as to work at any angle within certain adjustable limits; and he is also the patentee of a nest of colour saucers made so as to stand at different angles of inclination, or, if desired, to stand horizontally on a sloping desk.

**SANITARY RECEPTACLES.**—Messrs. W. E. Atwell & Co. send us a description and illustration of their dung receptacles, made of galvanised iron, which are specially constructed to meet the requirements of the London County Council for being readily opened and cleansed, and for ventilation. The receptacles are so constructed that the doors and lids can be thrown open or lifted off the hinges, and the bottom is curved so as to prevent the escape of liquid matter, while it can be easily cleaned and swept out. The receptacle appears to answer fully to the County Council requirements.

**PATENT OFFICE LIBRARY.**—The librarian of the Patent Office Library (25, Southampton-buildings, Chancery-lane), asks us to draw the attention of those of our readers of whom such a library may be useful, to the fact that the library is open for every week-day from 10 A.M. to 5 P.M. The library contains English, Colonial, and Foreign Specifications and Trade Marks, as well as a number of scientific text-books and periodicals.



**MEMBER BUILDERS' ASSOCIATION.**—The members of this Association held their annual meeting at the "King Arm's" Hotel, Commercial-st., on the 6th inst. Mr. J. Spink presided. Mr. Ward proposed "The City and Trade of the Field," and Mr. H. Brumby gave "The Poration." The latter gentleman alluded to the rates in the city, and contended that much of the expenditure was due to the Highway Department. He urged that the work could be done at much less cost by contract than by employment direct. Mr. George Carr, in replying, pointed out that some years ago the contracting for work was not satisfactory. Mr. Biggin proposed access to the Master Builders' Association, and pressed the opinion that workmen in the building were not of so good a class, as a body, as of ten or fifteen years ago. The London Builders, he said, were disappointed with the working shorter hours and higher wages movement, the argument that as much work must be done in a day of eight hours as in one of ten had been found to be erroneous, actually less work per hour being done. He thought that the present so-called system of apprenticeship was greatly responsible for the manner in which builders were treated by architects and employers, he advocated the general adoption of what was known as the London system, by which all matters in dispute were referred to a third party. Concluding, he urged the strengthening of their organisation.

**VENT LAW IN DENMARK.**—Messrs. W. P. Simpson & Co. Patent Agents, write to call the attention of our readers to the fact that on the 1st ult. a new Patent Law for Denmark passed Chambers of the Legislature, and it is expected to be signed by the king in the course of a few days. The principal features are the same as in Germany, Norway, and Sweden, viz.:—restriction from date of filing application; duration of patent fifteen years; importation of patented articles prohibited; examination as to novelty prior to grant; opposition to grant by interested parties. The new law is to come into operation at the middle of June.

**PAINTERS' TRAINING CLASS.**—This class, started by the Company of Painter-Stainers, and has before been referred to in our columns, completed its first term on the 6th inst. The Company have decided to open it again for a summer on the 24th inst. A good class of young men attended, and it is chiefly at their request that class will be open in the summer. The instruction is entirely practical; that is to say, it is with the manual processes upon which the excellence of workmanship depends.

## CAPITAL AND LABOUR.

**BRICKLAYERS' STRIKE, CROMER.**—The bricks employed by the Cromer builders have come into strike. The men had been receiving 5d. per hour. A deputation on their behalf had a conference with the masters, and asked 6d. per hour. Masters offered 6d. per hour, which the strikers were willing to accept, provided their employers sign a certain code of rules, which the masters were to do. This appears to be the sole point, which masters and men are now at variance.

**PLASTERERS' AND LABOURERS' STRIKE.**—The plasterers and labourers of the district have commenced a general strike for an increase of wages on those at present ruling in the district.

**STRIKE IN THE WOLVERHAMPTON BUILDING INDUSTRY.**—A dispute has arisen in Wolverhampton between the master builders and their workmen with reference to wages. About 150 men have come out.

## MEETINGS.

**FRIDAY, APRIL 13.**  
**Architectural Association.**—Mr. W. H. Seth-Smith on "The Success of Architectural Practice in the 19th Century." 7.30 p.m.  
**Institution of Civil Engineers.**—Students' Visit to the Bridge, London and South-Western Railway, to the sinking of a Caisson; and subsequently to the dock and weir at St. Margaret's, Richmond.  
**Engineering Society.**—Mr. William F. E. on "Lubricants; their Use, Testing, and so on." 8 p.m.

**SATURDAY, APRIL 14.**  
**Architectural Association.**—Visit to St. Paul's Cathedral to view the new mosaics. 2.30 p.m.  
**Paul's Ecclesiastical Society.**—Visit to St. Paul's Cathedral. 8 p.m.

**SUNDAY, APRIL 15.**  
**Engineers' Institution.**—Adjourned Discussion on Local Martin's paper on "The Report of the Ministry of Commerce and Taxation Committee of the London Chamber of Commerce on the Subject of the Rating of Ground in 1893." 8 p.m.

**Architectural Society.**—Mr. W. E. Hill on "The Architecture of the West of England," with illustrations. 6.30 p.m.  
**London and Yorkshire Architectural Society.**—(1) Annual Meeting. (2) Election of Officers. 7.30 p.m.  
**Photography.**—Captain W. De W. on "Photography." 11. 8 p.m.

**TUESDAY, APRIL 17.**  
**Institution of Civil Engineers.**—(1) Mr. Leveson Vernon-Harcourt, M.A., on "The Training of

Rivers." (2) Mr. Henri Léon Partiot on "Estuaries." 8 p.m.

**Builders' Clerks' Benevolent Institution.**—Annual Dinner, Holborn Restaurant. 6 p.m.

**Royal Institution.**—Professor J. A. Fleming, M.A., on "Electric Illumination." 8 p.m.

**WEDNESDAY, APRIL 18.**  
**Architectural Association Camera Club.**—Mr. Walter D. Welford on "The Hand Camera and Architectural Photography." 8 p.m.  
**Builders' Foremen and Clerks of Works' Institution.**—Quarterly Meeting of the Members. 8.30 p.m.  
**Society of Arts.**—Mr. Alexander Millar on "Design Applied to Carpets." 8 p.m.

**THURSDAY, APRIL 19.**  
**Society of Antiquaries.**—5.30 p.m.  
**Society of Arts (Foreign and Colonial Section).**—Mr. G. Collins Levey on "Tasmania and the Forthcoming Hobart International Exhibition, 1894-95." 8 p.m.

**FRIDAY, APRIL 20.**  
**Institution of Civil Engineers (Students' Meeting).**—Mr. Henry T. White on "The Sinking by Compressed Air of the Cylinder Foundations of the Trent Viaduct." 8 p.m.

**SATURDAY, APRIL 21.**  
**Architectural Association Camera Club.**—Visit to the Charterhouse. Meet at the Charterhouse at 2.30 p.m.  
**Edinburgh Architectural Association.**—Visit to the Glen.

**Queen's College, Cork.**—Mr. Arthur Hill on "The History of Architecture." XIV. 3 p.m.

## RECENT PATENTS:

### ABSTRACTS OF SPECIFICATIONS.

4,584.—**WINDOW FASTENERS:** *J. C. Howe.*—This invention consists of a metal-plate, wheel and two raised pillars or lugs, arranged to receive a thumb-screw entering holes in plate fixed on the top sash.

8,329.—**SLIDING DOORS:** *J. Luty.*—The doors which form the subject of this invention are mounted on a carriage with rollers fixed on metallic centres. The top of the door is fixed to the carriage by a fork, and a similar fork is affixed at the bottom of the door to allow of same operating in a slot in the floor.

8,441.—**COVERING AND DECORATING WALLS:** *N. Rigby.*—This invention consists of a compound of cement, plaster of Paris, white lead, and finely-powdered glass. This is spread on a sheet of highly-polished glass, and successive coats applied. The smooth surface is then soaked with linseed-oil and varnish, which is allowed to drain off and leave the surface hard and smooth.

8,680.—**VENTILATION:** *W. C. Toome.*—Specially suitable for application to windows, the ashes of which slide to open. It is modified form of one or both meeting bars, or an attachment thereto, which forms an opening, regulated from the interior of the apartment by a valve.

8,822.—**CHIMNEY COWL:** *J. Hacking.*—The cowl and shaft is made in the ordinary way, but instead of being mounted on a centre spindle the cowl is mounted on an annular ring supported by anti-friction runners, and easily rotated.

9,611.—**SAWS FOR STONE:** *J. L. Chevalier.*—The teeth of the saw which is the subject of this patent are formed separately from the blade, and these teeth have prepared cutting-points made of a fine quality of tempered steel, and are so attached to the blade of the saw that they can be removed for sharpening.

1,302.—**ROOFING TILE:** *T. A. Aldridge.*—To make a tile proof against rain and storms of wind some improvements are introduced. The tile consists of a foundation or body combined with ridges or projections on the front, and recesses, channels, and nail-holes on the back.

1,396.—**PAVING BLOCKS:** *G. Bagger (Antony).*—The blocks which form the subject of this invention are made of sawdust and fine stone pressed by hydraulic power under the simultaneous binding power of pressure and heat.

4,950.—**BOLTS:** *W. J. Motimer.* The bolt which is the subject of this patent is a barrel bolt, let into the door or window by a mortice. A slotted metal plate is fixed so as to allow the bolt taken by the knob to slide in and out of the opening made to receive it.

6,238.—**WOOD SCREWS:** *J. F. Fry.*—This patent relates to screws designed specially for work where the nature of the wood renders a risk of straining or splitting the wood. The screws are made with a tapered neck and a gimlet end to facilitate the insertion and screwing home with only a slight application of force.

8,833.—**WOOD SCREWS:** *W. F. Needham.*—This is a screw with an eye part, formed at a short distance from the head—that is, between the head and the wormed or screw-threaded portion. It is chiefly designed for use in angular wooden structures, or for securing angular parts of bamboo furniture together.

9,381.—**EARTH-CLOSETS:** *M. A. T. Wiede (Bremen).*—Consists chiefly in the employment in earth-closets, for the discharge of the disinfecting material to be strewn, of a tray connected with the holder of such material, and with the lid of the closet, in such a manner that when the lid is open it will not allow the material to escape, but releases it when the lid is closed, the material being at the same time loosened by a stirring mechanism.

9,468.—**VENTILATORS:** *H. T. Johnson.*—To prevent rain and dirt accumulating, and to admit of the interior being readily cleaned, a ventilator is constructed in three parts, a wall-box or grating, a wall-box for hopper, and a hopper and frame, the conjunction of these sections the desired end.

14,331.—**VENTILATING GREENHOUSES:** *F. C. Chadborn.*—A thermostatic device is employed for regulating the admission of fluid and controlling the admission of air to the greenhouse, the fluid (under pressure) being confined in a cylinder, and acting on a piston actuates the movement of the ventilator.

21,124.—**GUARD OR COVER FOR WOOD-CUTTING MACHINERY:** *J. Campbell and another.*—Consists of a fixed or adjustable vertical support carrying at its upper end an adjustable guard or cover.

15,500.—**COVERS:** *G. W. J. Martens (Hamburg).*—A double cone arrangement designed to facilitate the up-draught by deflecting the cross currents of air outside the cowl.

### NEW APPLICATIONS FOR LETTERS PATENT.

MARCH 19.—5,666, G. Bayliss, jun., Hanging and Fitting and Sliding Sashes for Windows.—5,695, R. Schleicher and G. Wersing, Water-closets.—5,704, D. Gray, Preventing Waste of Water.—5,710, W. Franklyn, Water-closets.—E. Leacy, Garden Paths and Gravel Walks.—5,724, J. Webber and others, Surveying Instrument.

MARCH 20.—5,734, P. Manning, Hanging of Sliding Window-sashes.—5,738, A. Vogt, Door Catches.—5,743, M. Syer, Flushing Tank Valves.—5,748, J. Driver and H. Gledhill, Strainers for Gullies and Sewer Traps.—5,764, O. Tilley, Treading Surfaces for Floors, Steps, and so on.—5,770, G. Stene, Bricks, Tiles, Wood, &c.—5,792, R. Sayer, Sanitation.—5,793, W. Turner, Fire-places and Ranges.—5,795, C. Pegram and O. Parsons, Fireproof and other Metal Roofs.—5,810, J. Flower and R. Cousins, Scaffoldings.

MARCH 21.—5,844, T. Robb, Block Flooring.—5,845, T. Robb, Window-sash Frames.—5,846, T. Robb, Securing the Coverings and Draining the Roofs of Buildings.—5,847, W. Morris, Sewer Pipes.—5,869, G. Pennie and W. Cockburn, Water Cistern for Flush-out Closets.—5,872, T. Jenks and T. Hook, Fittings for Hanging and Fixing Casement Windows.

MARCH 22.—5,961, T. Shurmer, Sliding Windows.—5,980, G. Benwick, Appliance for Use when Sawing Mitres.—6,011, A. Edells, Mouldings, Cornices, &c.—6,017, G. Clinton-Baker, Hinges for Grates and Doors.—6,030, W. Allen, Flushing Cisterns.

MARCH 24.—6,104, C. Koster, Manufacturer of Veneers.—6,134, R. Bell, Heating and Ventilating and Cooling and Ventilating Public Buildings, Hospitals, Houses, &c.—6,164, W. Bohn, Water Waste and Syphonic Discharge Closets and Latrines.—6,168, W. Horne, Construction of Fireproof Buildings, and Rendering existing Buildings Fireproof.—6,204, A. Lewis, Frames for Stained Glass Windows.

MARCH 28.—6,233, W. Duncan, Mantles for Incandescent Gas-burners.

MARCH 29.—5,296, J. Eggo, Window Fasteners.—6,329 J. Darbyshire, Screw-down Taps.—6,331, W. Prebble, Protecting Unburnt or Green Bricks against the Weather.

MARCH 30.—6,370, A. Hunter, Window Lock.—6,391, C. Mondy, New Sash-window.—6,411, J. Welch, Ventilator and Skylight.—6,415, G. Farin, Window Fasteners.—6,417, D. McVinn and J. Crawford, Holdfast for the Secure Fixing of Sash-line or Cord used in Hanging Windows.—6,498, R. Stone and E. Earle, Kilns or Furnaces.

### PROVISIONAL SPECIFICATIONS ACCEPTED.

2,370, W. James, Mouth Blow-pipe for the Use of Gas-fitters, plumbers, &c.—3,458, W. Briggs, Flushing Apparatus for Water-closets.—3,608, H. Johnson, Exhaust Ventilators.—3,785, A. Ransom, Cowl for Preventing Down Draught, Excluding Wind, Rain, and Creating an Upward Current of Air in Chimneys, Drain Ventilators, Rooms, &c.—3,802, R. Ames and L. Crosta, Joining Drain and Sewer Pipes.—3,864, C. Bonsey, Dies of Brick and Tile Making Machines.—3,970, J. Shepherd, Wood Screws.—4,095, H. Cleaver, Mortise Locks.—4,209, G. Anderson, Stone-Dressing Machinery.—4,311, J. Morris, Whitewash Brushes.—4,616, W. Flavell, Preventing the Freezing and Bursting of Water-pipes.—E. Francis, Reversible Safety Window.—2,693, W. Barrette, Wall-paper Edge Cutter and Border combined.—3,703, G. Brown, Draught Excluders.—3,885, A. Wynne, Air Bricks.—4,125, W. Cook, Ventilating Shells for Sewers, &c.—4,127, R. Holt, Siphon-Flushing Cisterns for Water-closets, &c.—4,403, J. Clegg and G. Parkinson, Doing away with Cords and weights in Sashes.—4,503, S. Meyer, Water-pipes.—4,530, J. Chadwick and E. Preston, Ventilating Appliances for Sewers.—4,638, J. Hall, Lime-kilns.—4,643, E. Cotton, Ventilation of Water-closet Pans whilst in use.—4,670, S. Holgate and L. Whitaker, Kilns for Drying and Burning Bricks, &c.—5,135, W. Wilding, Carpenters Gauges, &c.—5,177, E. Benard, Cements.—5,208, J. Munday, Flushing Cisterns.—5,395, A. Walker, Staircase and other Steps, and in Pavements, Floors, &c.

### COMPLETE SPECIFICATIONS ACCEPTED.

#### (Open to Opposition for Two Months.)

9,381, J. Huxsey and T. Diplock, Siphon Cistern.—10,048, T. Banks, Fireproof Framing for Partition and other Walls.—10,113, W. Bartholomew, Locks for Water-closet Doors, &c.—10,137, F. Willett, Temporary Supports for Tunnels, Sewers, &c.—11,343, C. Oaks, Intercepting Sewer-Trap with Portable Frame and Gratings.—12,324, W. Brown, Safety Wedge Cap for Securing Tools to Handles, &c.—7,234, R. Norris, Brick-moulding Machinery.—9,960, J. Lewisell, Channeled Flooring for Bridges and other Structures.—10,024, E. Poppe, Closets.—10,044, J. Banks, Fireproof Floors, Ceilings, &c., partly applicable to other forms of Floors, Ceilings, and Partitions.—11,095, W. Brown, Ornamenting Wooden Surfaces.—2,839, T. Brown, Raising, Lowering, Balancing, and Retaining in position the Sashes of Sliding Windows, and in means for Locking and Securing the same.

## SOME RECENT SALES OF PROPERTY:

### ESTATE EXCHANGE REPORT.

APRIL 2.—By *J. Baker*: 57, Penbridge-rd., Bayswater, u.t. 56 yrs., g.r. 104, r. 624, 600; 62, Lisson-grove, Marylebone, u.t. 46 yrs., g.r. 94, r. 504, 525; 64, Lisson-grove, u.t. 46 yrs., g.r. 94, r. 554, 500.—By *Fleuret, Sons & Adams*: A profit rental of 601, Wells-rd., Sydenham, with reversion, u.t. 32 yrs., 950.

APRIL 3.—By *Ellis & Son*: 78, Upper Thames-st., City of London, l.; and a warehouse in Brick Hill Lane, u.t. 3 yrs., g.r. 1504, 6,000.—By *Watson & Son*: 48, Millbrook-rd., Brixton, u.t. 28 yrs., g.r. 41, r. 281, 208.—By *J. Potter*: 169, Ferndale-rd., Brixton, u.t. 56 yrs., g.r. 61, r. 304, 2904; "Barclay Villa," Fraser-rd., Leyton, l., 501.—By *Eastman Bros.*: 1 and 2, Houghton Villas, Sydenham, l., r. 624, 760.—By *P. Hodson*: 62 and 64, Leicester-rd., Finchley, u.t. 97 yrs., g.r. 124, r. 604, 3254; 65 and 68, Leicester-rd., u.t. 98 yrs., g.r. 124, r. 644, 3304; 13 and 20, Sydney-rd., Wood Green, u.t. 96 yrs., g.r. 84, 88, r. 594, 156, 302; a plot of land, Colney Hatch Lane, Muswell Hill, 302.—By *Holland & Andrews*: 6, Smith-st., Chelsea, l., r. 484, 800.

APRIL 4.—By *Pouffret & Rosenberg*: "The Bishop's Down Grove Hydropathic Estate," Tunbridge Wells, containing 30 acres, f.i. including mortgage, 23,000.—By *Cane & Co.*: 6 and 8, Hindman-rd., Dulwich, l., r. 504, 590.—By *Beard & Son*: F.g.r. of 304, Baker-st., Haddenham, reversion in 96 yrs., 705; an income of 100l. per annum, Donaldson-bldgs., Tottenham Court-rd., l., 1,024; l.g.r. of 184, Queen's cres., Canthly Town, u.t. 52 yrs., 395; l.g.r. of 804, Wellesley-rd., u.t. 52 yrs., 3,990; l.g.r. of 354, Queen's-cres., u.t. 52 yrs., 500; l.g.r. of 144, 128, Wellesley-rd., u.t. 52 yrs., 2,800; l.g.r. of 84, Grafton-rd., u.t. 52 yrs., 1,000; l.g.r. of 44, Grafton-ter., u.t. 52 yrs., g.r. 64, 694; l.g.r. of 84, Wellesley-rd., reversion in 72 yrs., 1,050; l.g.r. of 64.



## COMPETITIONS, CONTRACTS, AND PUBLIC APPOINTMENTS.

## COMPETITIONS.

Nature of Work.	By whom Advertised.	Premiums.	Designs to be delivered.
*Cricket Pavilion	Bedford Corp.	10L 10s.	No date
*Infectious Diseases Hospital	Huddersfield Corp.	.....	Works
*Borough Board School	Leamster Sch. Bd.	.....	do.
*Workhouse Infirmary	King's Norton Union	£0L 30S. 6D.	do.

## CONTRACTS.

Nature of Work or Materials.	By whom Required.	Architect, Surveyor, or Engineer.	Tenders to be delivered.
*Public Urinals	East Ham Local Board	W. H. Savage	April 18
Whitstone Road Metal	Almwick and Cononago Local Board	G. Wilson	April 17
Forming Kerbing, &c. Sedgley-road	Coseley Local Board	C. W. Shackleton	do.
Small Buildings, National Schools, Horseforth, Leeds	.....	T. H. & P. Healey	do.
Stable, &c. James-street, Barnsley	.....	H. Crawshaw	do.
Electric Light Station, Turpin-street	Edinburgh Corp.	.....	do.
Surface Water Drainage	Bromley Local Board	.....	do.
Underground Conduits	Routhend-on-Sea Corp.	G. T. Coppley	April 18
Pipe sewer, Fremington, near Wigan	.....	Heston & Lath	do.
Deepening River Ythan, Auchterless, Aberdeen	.....	Walker & Duncan	do.
Entrance Gates, &c. (Contract No. 15)	.....	Thor H. Mawson	do.
Hanley, Staffs.	.....	G. H. Dixon	do.
Farhouse, Blackford, Co. Perth	Balrothery (Ireland) Union	C. M. Tuttle	do.
Labourers Cottages, &c.	.....	Heston & Lath	do.
Twenty-two Cottages, Yatrad Rhonda, Glam.	Partidge Buildg. Club	.....	do.
House and Shop, Tongatree, Bradford	.....	Fred. Moore	April 19
House, Shop, Stable, &c. Newcastle-on-Tyne	.....	Jno. Swinburne	do.
Additional, &c. to Schools, Abernethy	Abernethy School Board	T. Bodrick	do.
Shop and House, Great Broughton	W. Lister	.....	do.
Rectory of Cantons House	Barnham Corporation	W. A. Valm	do.
Rectory of Harbour Master's House	.....	do.	do.
Extension to Farmhouse, Clifton-road	Bristol Hospital	Official	do.
Wentworth Farm	Salford Corporation	do.	do.
Bridge Work, Treadwell Bridge	Bury District Corp.	do.	do.
Two Houses, Levercroft, Walsbaw, Bury	Provision Soc.	do.	do.
Latex	Howden (York) High	do.	do.
Road Metal	Way Board	J. Anderson	do.
Six Cottages, Nelson-street, Harport, Cumberland	J. A. Anderson	C. Eaglesfield	do.
New Man Sewers	Bournemouth Council	P. W. Lacey	do.
Lincolne Road Metal, Tredgarn, Glam.	Durham, U.S.A.	J. H. Lewis	April 21
(4,000 tons)	Bedwellty Local Board	Mr. Coldwell	do.
Hospital, Sunderland-road	.....	H. Mansell	do.
Additions to Asylum	Warwick	P. Masle	do.
Warwick	Visiting Committee	Jackson & Fox	do.
Sewage Works	H. Mansell	do.	do.
Drainage (large contract), Alverthorpe	Wakfield U.R.B.A.	do.	do.
Re-building Saddle Inn, Halifax	Hancock & Co.	Geo. Thomas	do.
Additions to Collet Arms Inn, Merbury	Glanvynsham Corp.	P. Pickwell	do.
Pavilion Extension, Peasart, Caniff	Club Committee	Mr. Yockney	do.
Passenger Station, Cymer	Rhonda and Swavesay Railway Co.	Mr. Ross	do.
Alterations to Schools, &c. School-street, Arrington	G. N. E. Co. (Ireland)	Petty & Ives	April 23
Extension of Store Buildings, Belfast	.....	Jno. Kelly	do.
Additions to Jumps House, Overend, Halifax	.....	.....	do.
Annexe, Hilly Well House, Leeds	.....	.....	do.

Those marked with an Asterisk (\*) are advertised in this number. Competitions, pp. iv, v, vi, vii, viii, and ix. Public Appointments, pp. xi, xii, and xiii.

Spencer-rd., ditto in 74 yrs., 155l.; f.g.r. of 15l., Sunner-rd., Croydon, ditto in 58 yrs., 450l.; f.g.r. of 12l., Bangor-st., Notting Hill, ditto in 72 yrs., 805l.; f.g.r. of 24l., ditto in 73 yrs., 415l.; f.g.r. of 14l., ditto in 72 yrs., 450l.; f.g.r. of 12l., ditto in 71 yrs., 300l.

APRIL 5.—By A. Richards: "Roxford House," High-rd., Ponder's End, f. 780l.—By Stimson & Sons: 44, 44, and 46, Chapel-rd., Norwood; and 1 to 9, Curmick-rd., f. 3,000l.; f.g.r. of 10l., Eauxfield, Limehouse, reversion in 20 yrs., 170l.; 22 to 25, Drysdale-rd., Lewisham, u.t. 58 yrs., g.r. 12l., 600l.; 27 to 39 (odd), Chadwick-rd., Peckham, f. 1, 125l., 4,750l.; 8, Bermondsey-st., Bermondsey, f. 4,00l.; 132 to 139, Prince-rd., Kennington, u.t. 44 yrs., g.r. 135l., 3,300l.; 161, 163, and 165, Boyson-rd., Walworth, u.t. 58 yrs., g.r. 18l., 715l.; 3, 5, and 7, Rutland-rd., Clifton, f. 2,850l.; 14, Homley-rd., u.t. 70 yrs., g.r. 10s., 320l.; 11, The Parade, Sydenham, f. 400l.—By Newson & Co.: 26, 28, and 30, Legard-rd., Highbury, u.t. 50 yrs., g.r. 18l., 655l.; 55, Arlington-rd., Brixton, u.t. 31 yrs., g.r. 8l., 10s., r. 40s., 755l.; 187, King's-rd., Camden Town, u.t. 48 yrs., g.r. 11l., r. 50l., 350l.; 33, Alexandra-rd., Hornsey, u.t. 31 yrs., g.r. 7l., 10s., r. 34l., 300l.—By Blake & Darnall: 9 and 11, Ladywell-pk., Lewisham, u.t. 44 yrs., g.r. 10l., 10s., 185l.; 29, Rumsey-rd., Brixton, u.t. 37 yrs., g.r. 8l., 55l., 400l.

APRIL 6.—By R. Reid: 41, Wardour-st., Soho, f. 1, 2,000l., 3,000l.; No. 19, Regent-st., an l.g.r. of 53s., u.t. 23 yrs., g.r. 6l., 2s. 6d., 1,750l.—By Green & Sons: 25, Kemp-shot-rd., Streatham, u.t. 8 yrs., g.r. 11l., r. 55l., 460l.; 6 and 7, Dunlop-pl., Bermondsey, f. 300l.; 59, 61 and 63, Napier-rd., Croydon, u.t. 73 yrs., g.r. 10l., 100l.; 1 and 3, Totton-rd., Thornton Heath, u.t. 38 yrs., g.r. 18l., 125l., 370l.; f.g.r. of 14l., 14s., Beachwood-rd., Caterham, reversion in 18 yrs., 335l.; "Woolmer Lodge," Banstead, Surrey, and 0 to 2, p. 1, f. 85l., 10s., 1,000l.; f. cottage and enclosure of garden land, 400l.; the residence called "Kethlen," f. 460l.; a leasehold house, Mill-st., Redhill, u.t. 76 yrs., g.r. 6l., 80l.; three leasehold houses, Garbaldie, u.t. 73 yrs., g.r. 15l., 345l.; 342, Trafalgar-rd., Greenwich, u.t. 35 yrs., g.r. 10l., 92l., 1,300l.—By L. Farmer: 60 and 62, Fordwych-rd., Hampstead, u.t. 42 yrs., g.r. 20l., r. 140l., 1,300l.; 139, Abbey-rd., St. John's Wood, u.t. 61 yrs., g.r. 9l., 430l.; "St. Andrew's Lodge," Dean-rd., Willesden, u.t. 86 yrs., g.r. 10l., r. 65l., 570l.; "The Elms," u.t. 86 yrs., g.r. 9l., r. 55l., 475l.; 35 and 37, Gascony-av., Hampstead, u.t. 87 yrs., g.r. 21l., r. 80l., 125l.; 43, 45, and 47, Gascony-av., u.t. 87 yrs., g.r. 21l., r. 120l., 795l.; 13, Steward-st.,

Spitalfields, r. 56l., 700l.; 18, Elm Grove, Peckham, u.t. 34 yrs., g.r. 7l., r. 45l., 300l.—By F. J. Biley & Sons: 69 and 71, Albion-st., Rotherhithe, f. 465l.; 21 and 23, Moreton-rd., and 26, Prospect-st., u.t. 49 yrs., g.r. 16l., 270l.—By J. Harman: 105, 107, 109, and 111, Grayling-rd., Stoke Newington, u.t. 64 yrs., g.r. 14l., 750l.; 30, Cazenover-rd., u.t. 31 yrs., g.r. 9l., 90l., 500l.—By J. B. Hall: "Frenches," Birkhurst, Brixton, with stabling, f. 2,000l.; 2, Mervyn-rd., Brixton, u.t. 70 yrs., g.r. 10l., 455l.; "Springfield," South Canbury-pk., Canbury, u.t. 42 yrs., g.r. 7l., 750l.; 207, 207A, 207B, 209, 209A, 209B, 211, 211A, 213A, Hornsey-rd., Holloway, u.t. 96 yrs., g.r. 55l., 165l., 4,005l.; 1 to 13, Pleasant Passage, and 4 to 12 (even), Hornsey-rd., u.t. 16 yrs., g.r. 60l., 125l.

(Contractors used in these Lists.—F.g.r. for freehold ground-rent; l.g.r. for leasehold ground-rent; f.g.r. for improved ground-rent; g.r. for ground-rent; r. for rent; f. for freehold; c. for copyhold; l. for leasehold; g.r. for estimated rental; u.t. for unexpired term; p.a. for per annum; yrs. for years; st. for street; r.d. for road; sq. for square; pl. for place; ter. for terrace; cres. for crescent; yd. for yard, &c.)

## PRICES CURRENT OF MATERIALS.

TIMBER.		White Pine	Black Pine	Red Pine	Yellow Pine	Soft Pine	Hard Pine	Oak	Walnut	Box	Teak	Deodar	Fir	Spruce	Pine	Aspen	Birch	Alder	Hazel	Willow	Sycamore	Maple	Plane	Poplar	Juniper	Cedar	Cypress	Myrtle	Box	Teak	Deodar	Fir	Spruce	Pine	Aspen	Birch	Alder	Hazel	Willow	Sycamore	Maple	Plane	Poplar	Juniper	Cedar	Cypress	Myrtle																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																											
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ST. JUST (Cornwall).—For additions, &c. (first section) to school buildings. Perimeter for the School Board. Mr. J. W. Troason, architect, 1, Exeter Street, Penzance.

R. H. Roberts .....	£465 19 0
J. Rowe .....	98 0 0
T. Legge .....	57 12 0
J. S. Smith .....	82 0 0
J. S. Smith .....	72 12 0
J. E. Hoskins, Drift Sanderstead .....	72 0 0

T. Harry, North St. Just, R.D. .... 83 0 0  
\* Accepted.

SHEFFIELD.—For the erection of dwelling-house, offices, &c., Darvall, for the Waverley Company. Mr. E. Winder, jun., architect, Waverley Street, Sheffield.

J. Fidler .....	£255 0 0
J. Holmes .....	645 0 0
C. Chadwick .....	537 12 0
H. S. Sykes .....	628 17 2
Stow & Aspland .....	591 5 6
Edmondson .....	592 4 0

SLEAFORD (Lincoln).—For the erection of a dwelling-house, for Mr. Wm. Clark. Mr. Wm. Saxton, architect, Sleaford.

Books .....	£938 5 0
J. B. Newson, East Heckington .....	215 10 0

SL. MGH.—For the erection of two new houses for Mr. Charles West, Wellington Street, Slough. Mr. John George Carey, architect, Slough.

C. Simmons .....	£1,135 11 11
M. D. Bowyer .....	[All of Slough.]

SOUTHAMPTON.—For the erection of an engineering laboratory, Cam. Wk. for the Council of the Hartley Institution. Mr. W. B. C. Bennett, Borough Engineer, Southampton.

Dyer & Sons .....	£779 17 10
Roe & Grace .....	750 0 0
C. Osman .....	742 0 0

ST. HAMPTON.—For the erection of private improvement works, North, under and all, and four other roads, for the Corporation. Mr. W. B. C. Bennett, Borough Engineer, Southampton.

Porter .....	£1,598 0 0
Roe & Grace .....	275 0 0
C. Osman .....	968 0 0

STRATHMORE (Aberdeen).—Accepted for the supply of 300 tons of material, for the Town Council. Mr. Allen H. Campbell, C.E., Strathmore, Aberdeen.

W. A. Jenkins, Nanterton .....	£5 7 0
C. Reid & Co., Strathmore .....	0 11 0

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W. A. Jenkins, Nanterton .....	£5 7 0
C. Reid & Co., Strathmore .....	0 11 0

SWANSEA.—For the erection and completion of villa residence, Strathmore, Swansea. Messrs. Wilson & Moxham, architects, Swansea.

Old Jenkins .....	£260 0 0
W. Knight .....	£947 0 0
Donna W. Williams .....	1,022 0 0
Bennett Bros. .....	1,022 0 0

SWANSEA.—Accepted for the erection and completion of villa residence, Strathmore, Swansea. Messrs. Wilson & Moxham, architects, Swansea.

Bennett Bros. .....	£191 0 0
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TINTAFLA (Aberdeen).—For all houses to private hotel, Messrs. Wise & Wain, architect, Tintinfla, Luncannon.

W. A. Jenkins .....	£495 0 0
E. Sharland, Luncannon .....	351 0 0

WATFORD.—For the erection of a large hall and premises, for the Liberal Club, situated at 19, Pinner Road, Watford. Mr. J. George Carey, architect, Watford.

A. H. Reavell .....	£475 0 0
Watford .....	£475 0 0

WINDSOR.—For the erection of a large hall and premises, for the Liberal Club, situated at 19, Pinner Road, Watford. Mr. J. George Carey, architect, Watford.

A. H. Reavell .....	£475 0 0
Watford .....	£475 0 0

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## TO CORRESPONDENTS.

A. S. (amounts should be stated).—P. E. M. (the greater the letter has nothing to do with the subject of our remarks).—P. B. (what you say may be true as to smaller local matters, but where proper sanitation is a more elaborate and difficult matter).—E. S. and M. (next week).

All statements of facts, letters of tenders, &c., must be accompanied by the name and address of the sender, not necessarily for publication.

We are compelled to decline pointing out books and giving addresses.

NOTE.—The responsibility of signed articles, and papers read at public meetings, rests, of course, with the authors.

We cannot undertake to return or acknowledge communications.

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Advertisements for the current week's issue are received up to THREE o'clock p.m. on THURSDAY, but "classification" cannot be guaranteed for any which may reach the office after HALF-PAST ONE p.m. on that day. Those intended for the front Page should be in by TWELVE noon on WEDNESDAY.

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London Agent:

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Telephone No. 270.

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Old Greyfriars and Newgate.—Drawn by Mr. H. W. Brewer	.....Double-Page Photo-Litho.
Proposed Additions to Totley Hall.—Mr. J. D. Webster, F.R.I.B.A., Architect	.....Double-Page Photo-Litho.
Noakes Memorial Pulpit, St. Peter's Church, Bushey Heath.—Mr. James Neale, F.R.I.B.A., Architect	.....Single-Page Photo-Litho.
St. Andrew's Free Church, Ayr.—Mr. J. B. Wilson, A.R.I.B.A., Architect	.....Single-Page Photo-Litho.
Part of Chimney-piece by Wm. Burges in his House at Holland Park.—Drawn by Mr. W. R. Lethaby	.....Single-Page Ink-Photo.
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### Wholesome Dwelling-Houses.



UNDER the title "Dwelling-Houses,"\* Professor Corfield issues the third edition, revised and with new illustrations, of his treatise originally delivered in the shape of a course of Cantor Lectures before the Society of Arts. The main title, which appears alone on the back of the book, is a little too laconic, for there is a good deal more to be considered in dwelling-houses than their sanitary quality. That however is no doubt the first consideration, without which convenience of planning and beauty of decoration are of no value, and may tempt a man into a house which will only prove a passage to the last house of all. As Professor Corfield has devoted himself especially to the consideration of sanitary conditions in buildings, his short summary of the subject, in which no words are wasted, is of considerable interest.

The author naturally deals first with the general question of site and construction of houses, in regard to which, though his recommendations are for the most part only such as are generally accepted, he draws attention to one or two points which still require to be emphasised; for instance, that concrete under a house is worse than useless unless made with the best cement, which will be under no danger of cracking and allowing ground-air to pass through; that in the case of made soils, the covering of the foundation should extend for some distance round the house ("some distance" is a rather vague expression); that the walls below the ground and for a little distance above it should be made of exceptionally good material, and set in cement, so as to be as impervious as possible to damp. We suspect there are still a good many houses built in which it is considered allowable to use inferior bricks where the brickwork is out of sight. His recommendation of pipe-lined flues, in respect that "they are more easily cleaned, an updraught is more readily established in them, and they completely disconnect the flue from the structure of the

house, and so help to prevent destruction from fire," is perfectly true; it might be added that both from their smooth surface and absence of angles they hold less soot, and therefore require less cleaning. For ordinary houses, however, the additional expense of this method is an obstacle, and the ordinary circular pipes are not the best adapted for building into brickwork. There is room, we might suggest, for a new form of stoneware chimney-lining, rectangular on the outside, so as to fit into 14 in. by 9 in. brick openings, and with an elliptical inner section, so as to secure the advantage of absence of internal angles with as little waste of space and material as possible.

Whether fireproof floors are really so desirable in an ordinary dwelling house as the author seems to think, may still be an open question; at least as long as it is a house in one occupation and not in "flats." There are certain rooms, bath-rooms for instance, which no doubt should always be made with solid and impervious flooring; but the general use of the kind of floorings which are comprised under the rather deceitful title of "fire-proof" is hardly a necessity for the ordinary class of private house. This class of floor means entire rigidity of surface; desirable in a billiard-room no doubt, but it may be questioned whether it is so desirable in a drawing-room. If a wooden flooring is placed on such a floor, however, it should be possible to form it without hollow spaces between. These, as Professor Corfield says, require ventilating, but with ventilation (and even to some extent without it) comes dust and dirt, to gather undisturbed. Our creed is—no hollow spaces that cannot be got at; a point Professor Corfield does not touch on. The sight of the accumulations in some of these hollow spaces when exposed after a lapse of years, as we have seen them sometimes, ought to make every sanitarian think twice on this point. While on this matter of flooring, we may mention that in some experiments on fire-proof floors made in Germany, the most fire-resisting floor proved to be one of solid beams of timber laid close together. We believe an English architect has actually tried this in his own house. We have not heard enough of the results generally to recommend it, but we refer to it as a floor idea that may be worth consideration.

As to the finishing of the inside of the rooms, the author rather startles us with the observation that "tiles make an admirable wall covering, and are moreover a permanent decoration;" rather too permanent, some may consider. But does Professor Corfield, as a medical man, seriously mean to recommend tiles for the internal finish of living-rooms? They would make a very cold room, and in certain states of the English atmosphere would be found covered with condensed moisture. The statement that "paper should not be used for covering ceilings" is only true so far as the same prohibition may be applied to walls. It is not, certainly, the most sanitary method of finishing the walls of rooms. At the same time those who, in the name of sanitation, refuse it, must be prepared to find that any other method of making their walls and ceilings look attractive will cost them a good deal more. One extra reason against the ceiling paper, certainly, which might have come within Professor Corfield's scope, is that it does not reflect so much light as a plastered ceiling; and light is an element of healthy conditions in a dwelling house.

In regard to ventilation we are glad to see that Professor Corfield at least admits that "theoretically" the admission of pure air should be at the lowest part of the room, though in practice this cannot be precisely carried out. With the author's recommendations on the subject of ventilation we are generally in agreement. His remarks upon cowls should be noted, and on the delusive or uncertain character of their supposed influence in forming up-draughts. We quite agree with him that it is at variance with true sanitary principles to make openings from the interior of rooms into chimney-flues, and then resort to flap-valves to prevent the air of the flue coming in. These often do not act, and when they do act are generally disagreeably noisy, though we noticed recently a patent for diminishing the noisiness of their action. The true way of using the upward-drawing action of a flue is, as the author says, to build an air-flue alongside of it, or form one in the same piece of fireclay as the smoke-flue itself. Of course there is again the difficulty that these are liable to become inlets instead of outlets when the flues are not in use, and there are generally only one or two flues in the house, often only one, in

\* Dwelling-Houses; their Sanitary Construction and Arrangement. By W. H. Corfield, M.A. Third edition. London: H. K. Lewis. 1894.



regular use all the year round. The employment of a gas-jet for producing an extract current in such an air-flue would be a useful application of a substance which we are less and less inclined to use for lighting. It is used in this way, but we think only in isolated instances.

In his chapter on water supply Professor Corfield only touches in passing on the *vexata questio* of water-supply from open rivers, though his passing touch is significant: "most of the river water is contaminated in various ways during its passage through towns, and without entering further into the subject here, I would merely say that it is better to obtain water that has not been contaminated, than to take water which we know has been contaminated, and then try to purify it." That is the common sense of the matter in a nutshell. In regard to lead pipes, the danger of which, except for soft waters, Professor Corfield does not think very much of so far as internal action of the water conveyed in them is concerned, he mentions however a case in which lead pipes were attacked and injured not by the water conveyed through them, but by outside water in the soil through which they passed, containing carbonic acid. In regard to pipes made of lead lined with tin, he does not mention the objection which we alluded to the other day, of the difficulty of making a joint with them in any manner which will equally suit the lead and the tin, but he calls attention to another objection, that if the tin is once damaged "galvanic action is set up, and the lead is dissolved quicker than ever." He refers to wrought-iron pipes, with some approval, but not to the tin-lined wrought-iron pipe, to which we called attention at the Building Exhibition the other day, to which the only objection, as far as we can see, is cost. That, however, we imagine had hardly been brought into notice when his book was printed.

Professor Corfield speaks with approval of the idea of separate water-supply for drinking and cooking purposes, provided from some specially pure source, without wasting it in uses for which a high standard of purity is not requisite; and he instances the example of the Romans in this respect. It is a correct principle, and may be carried out in towns of a limited size; we should almost regard it as practically impossible for London.

With the system of constant service, Professor Corfield observes, there is no necessity to have such receptacles as cisterns at all; he should have said, there ought to be none. Unfortunately water companies which profess to give constant supply are not always to be depended on, and they are, perhaps, the less careful as to the inconvenience of stopping the supply for two or three hours from a knowledge that a majority of the public do not really act up to the system, and continue to use their large and often ill-cleaned cisterns when they might have the water direct from the main. One advantage of the constant system, as the author points out, is that the pipes being always full of pure water under pressure, are more likely, if there are any weak points in the mains, to leak out into the soil than to admit contaminated leakage from the soil. Wherever constant service has been given, it is greatly to be desired that the public should understand the immense advantage of doing away with large storage cisterns, which are opportunities for the water getting fouled, and using the service direct from the main; and if the water companies found that this was really done by the majority of their customers they would probably take more care to avoid any not absolutely necessary interruption in the supply.

In regard to the removal of refuse matters the author sums up entirely against the earth-closet system for large towns, as impracticable for a variety of reasons which he states, and which we recommend the advocates of that system to consider. In regard to water-closets we are rather surprised

that he does not figure and recommend a wash-out closet with a deeper standing pool of water in the pan than the one which he gives a section of, as some are made which give a deeper section, and if not more sanitary, they are certain better deodorisers. The author does not express any opinion as between wash-out closets and valve closets, which we should have expected to find dealt with.

The book is, however, a most useful one for the general public, as it gives within a small compass a clearly-written and intelligible outline of the principal conditions which go to make a wholesome dwelling-house. It is a book not so much for experts as for general readers, and we recommend it strongly to their attention.

#### NOTES.

FROM every point of view it is desirable that the question of Betterment should be settled one way or another. Therefore it is satisfactory that the House of Lords, on Monday, nominated a committee to inquire into this subject. The Prime Minister consented to the committee with a kind of proviso that its nomination should be a bar to any Bill which might be brought forward in which the question was raised. But it is absurd to suppose that if there is a case for investigation and consideration, it would be reasonable to anticipate the result of this committee by passing a Bill in which the principle of Betterment was adopted. The fact is that if the committee pronounce in favour of Betterment, and at the same time show how it can be carried out in practice, the new principle will be sure of success; if, on the other hand, the committee pronounces adversely, it is obvious that the hostility to the principle will be strengthened both by facts and by argument.

IN reference to the constantly-recurring complaint about the offer of commissions to architects if they will use this or that material, an eminent architect sends us an exceptionally flagrant specimen of this kind of impertinence, in the shape of a circular recommending a certain paint for damp walls, which concludes—

"If you can influence us any orders for this article we shall be glad to reserve for you upon such sales a brokerage of 10 per cent., and shall be pleased to hear that you will take up the recommendation of this paint."

Our correspondent asks, with an emphasis by no means too trenchant, "Can you do nothing to expose this kind of black-guardism?" and this quotation of his *ipsissima verba* may be useful as giving the authors of the circular some hint as to what kind of good they have done themselves, in a commercial sense, by circulating such an impudent proposition to architects in the front rank of the profession. As to exposing this kind of thing, we have been diligently doing that, whenever it came under our notice, for years back. The present case is such a flagrant and barefaced one that we feel justified in naming the authors of it—Messrs. Johnson Brothers, paint manufacturers, Hull; who had better send a printed apology to all the members of the architectural profession to whom they have sent this insulting circular, unless they wish to find themselves put under a general interdict.

THE method proposed by the railway companies for testing the reasonableness of advanced rates, to which we alluded last week, does not appear to find favour with the Mansion House Association. They suggest as an alternative, pending further legislation, that outstanding disputes be referred to the Board of Trade under the conciliation clause of the Act, and would be willing to accept the recommendations of the Board, provided the railway companies would agree to do the same. We do not suppose

that the companies will give their assent to this proposition. The Board of Trade has done much good in its mediatorial capacity, but the benefit has accrued to the traders rather than to the railway companies, and it will hardly be surprising if the latter, in a matter of this nature, should prefer a legal decision to that of the Board. In the meantime, Mr. Mundella's promised Bill has been introduced, and was read the first time in the House of Commons on Thursday. It provides that in any case of increase of charges since December 31, 1892, it shall lie on the railway companies to prove that such increases are reasonable; and for that purpose it shall not be sufficient to show that the rate is within the maximum allowed by any existing Act of Parliament. This strikes a blow at the principle of maximum rates, which the companies are almost certain to resist, and they will probably challenge the proposal at some subsequent stage of the Bill, although no criticism was offered on the first reading. Sir James Whitehead certainly attempted to explain the views of the Mansion House Association, but was ruled out of order.

WHEN the case of *Martin v. Price*, was decided in December last by the Court of Appeal, it was briefly noticed in these columns. In that case Mr. Justice Kekewich found, as a fact, that the plaintiff's right to some light had been interfered with by so much of the defendant's building as had been erected, and would be further injuriously affected by that part which was yet to be built. But, as he considered that the plaintiff could be properly compensated both for the actual and the future injury by damages, he awarded him a sum of 120*l*. The Court of Appeal reversed the decision so far as regarded the damages for prospective injury, holding that on the facts the plaintiff was entitled to an injunction to restrain the defendant from continuing his building. But now that the case is reported in the official and full report, it is clear that they left undecided the very important question whether a Court has jurisdiction to award damages by way of compensation for an injury not yet committed, but only threatened and intended. Upon the point authorities differ, the late Mr. Justice Pearson in *Holland v. Worley*, did award damages instead of an injunction in such a case. But, in another case not concerned with light, the Court of Appeal expressed a clear opinion against the existence of such a jurisdiction. The sooner this legal doubt is set at rest the better, since there can be no doubt that if the jurisdiction exists there may be cases in which it is the truest justice to award a plaintiff damages in place of an injunction. It is easy to imagine the case of a plaintiff whose future diminution of light may be compensated by a hundred pounds whilst, if the defendant is prevented from continuing the building, he may lose several thousand pounds. On the other hand it may fairly be argued that until an injury is actually done it is impossible to estimate what sum will be sufficient compensation for it, and therefore that the only reasonable and proper course is to make use of the legal machinery called an injunction to prevent any future injury at all. But, be that as it may, the deliberate doubt, if it may be so called, of the Court of Appeal in *Martin v. Price* makes it very desirable for some suitor to benefit the public by setting the question at rest.

THE decision of the Court of Appeal in the litigation between the London County Council and the London Tramways Company is to be reviewed by the House of Lords. The recent decision therefore does not possess the interest of an actually final judgment, though we strongly doubt if it will be reversed. The main question in dispute is whether in fixing the price which the Council are to pay for the tramway, past and future profits are to be taken into consideration. The Act under which the



ncil are enabled to purchase the under-  
g says that the company shall sell their  
upon the terms that the Council pay  
m their value (exclusive of any allow-  
for past or future profits of the under-  
ing.") These words seem clear, and the  
of Appeal has only given to them  
meaning which would be applied by nine  
out of ten—namely, that past and  
re profits are not to be considered in  
price. In some respects this seems  
asonable, since an ordinary buyer of a  
mercial business looks to past and future  
its as the main element in fixing  
price. On the other hand, it may  
y be argued that the Legislature does  
ntend that the municipal authorities  
ld pay a larger price simply because the  
rtaking had been successful. Tramways  
d B might each cost the same amount  
start, but A might run through an  
easing and populous district and B  
ugh a stationary one, so that at the end  
en years, if profits were considered, A  
ht be worth twice as much as B, though  
initial cost had been the same. Why,  
hould the municipality pay more in the  
case than in the other? As against this  
e is the ordinary rule as between buyer  
seller that profits are considered. Thus  
e is something to be said in favour of  
view for legislative purposes. For the  
ent, however, it is not a question of  
lation but of construing an Act to  
tain the meaning of it, and it must be  
essed that the meaning does not seem  
ptful.

HE last three years have been dis-  
astrous ones for building enterprise on  
Continent. One of the few cities in which  
itects and builders have, however, had but  
reason to complain is Berlin, though, of  
se, had there been better times there  
ld have probably been a yet greater  
vity there. The work done at Berlin is  
nguish by its substantial character.  
he speculative buildings this is, of course,  
ly due to the stringent building regula-  
s; but in many of the private houses  
ay ascribe it to the general wish to  
d well. In the better class private work  
stucco façades for which Berlin had a  
tation have almost disappeared, and  
e elevations take their place. In the  
riors vulgarly painted decoration has been  
erseded by good decorative plaster-work  
lly relieved by colour. Painted wood is  
h becoming a rarity, natural or stained  
d taking its place, and as far as the  
ngs are concerned, great progress has  
n made both in practicability and taste. Of  
predominant architectural styles in vogue  
Berlin, the so-called "Barocco" and  
odification of the Nuremberg "German  
aissance," one cannot say so much; they  
ld not find many admirers in this country.  
e amount of money spent on first-class  
dences and in good shop premises or  
ls is remarkable. In the fashionable  
ergarten quarter a number of such  
dences have been put up lately varying  
ost from 10,000*l.* to 40,000*l.* and in some  
s even more. The whole feeling of  
e villas is of course "palatial" as distinct  
n homely, and it is a rarity to find a room  
t the average English householder would  
e to call his own; and improved as the  
ngs, especially the sanitary ones, may be,  
bath-rooms, water-closets, sinks, &c., in  
e minor palaces are still open to  
h criticism in the eyes of an English  
iect. Introducing English patents alone  
not do it. The principle of our arrange-  
nts and requirements must be first under-  
d before the details can be adapted.  
ilar criticism may apply also to the  
duction of English architectural forms in  
Berlin suburbs, which now swarm with  
-interpreted "English" half-timber and  
work. The coarsest individuality of the  
Rennaissance cottage is certainly  
er than this.

OF the many International Exhibitions  
organised for the coming summer, the  
Transport Military Commissariat and Life-  
saving Exhibition, which is opened on Friday  
this week at Vienna, ought to be one of the  
most interesting if only half of its compre-  
hensive programme is fulfilled. Several of  
the sections are to have exhibits which will  
call for the attention of architects. In the  
Commissariat Division there are all manner  
of cooking apparatus to be represented, and  
one of its sections is to be entirely devoted  
to "storage"—*i.e.*, larder fittings, ice-cellars,  
cooling-rooms, refrigerators, &c. In the  
hospital section of this Division a number  
of sanitary fittings are to be made room for,  
whilst the Life-saving Division will contain  
everything pertaining to ambulance service,  
including the plans of the stations and  
"first-aid rooms," of which Austria can boast  
of many practical examples. In this Division  
there is very naturally a section devoted to  
household fire-escapes, though we doubt if  
anything really serviceable—*i.e.*, not suitable  
for the use of acrobats only, will be found  
there. In the "preventive" class of this  
Division some exhibits relating to the safety  
of workmen on scaffolds, &c., have also  
been promised. The Exhibition is in the  
"Rotunde" of the Prater Park. Like all  
Exhibitions, it is not ready on its opening  
day.

THE "Upper House" of the Swiss Par-  
liament has now definitely decided, by  
a vote of twenty to thirteen, that Berne is to  
have a new home for the country's repre-  
sentatives, at a cost of between five and six  
million francs, or over 200,000*l.* The pro-  
posed building, which will stand between  
the old "Bundesrathhaus" of 1852 and the  
new Government offices, but lately com-  
pleted, will be erected from the designs of  
Professor H. Auer, and, together with the  
two blocks mentioned, will form an imposing  
*ensemble* on a prominent site overlooking  
the River Aar, with the Alps beyond. The  
scheme has been under the consideration of  
the authorities some ten years, and has been  
the subject both of an open and a limited  
competition.

ON the 17th inst. the directors of the  
Rollason's Wind Motor Company  
exhibited the plant they have erected at  
Willesden. The motor is mounted on an  
open ironwork structure 30 ft. high, and is  
20 ft. in diameter. A vertical steel shaft  
carries five sails, which are portions of  
cylindrical shells cut off parallel to the  
axes. The concave sides face the wind, and  
the addition of ridges sloping downwards  
from the shaft is said to materially increase  
the output; the convex sides are sheltered  
by a framing which is attached to a large  
vane on the top of the tower, so as to be  
moved into the proper position as the wind  
shifts. Means have been taken to store  
abundance of lubricant in order that the  
motor may be left working without atten-  
tion. The power produced is used for  
driving some electric machinery which  
Messrs. Edmundsons have put up, but there  
is little in it that calls for special comment.  
A dynamo charges accumulators with the  
usual switch-board arrangements. It is  
proposed to attach an ordinary form of  
half-governor to the vertical shaft, which  
will shift the main driving-belt on to a  
loose pulley should an unusually high wind  
cause the motor to revolve too rapidly for the  
dynamo. An arrangement which is attached  
to some intermediate gearing, though not yet  
completed, will form an important adjunct  
to the system. A right and left handed  
thread is cut on a shaft which revolves con-  
stantly; two half-nuts placed on opposite  
sides of the shaft have corresponding  
threads cut, one in each of them, so that a  
block to which they are attached can be made  
to move in either direction according to  
which half nut is brought into action. When  
the cells are fully charged, a hydrometer,  
placed in one of them, rises and makes an  
electrical contact which causes an electro-

magnet to bring one of the half-nuts against  
the revolving screw; the block moves and  
throws the belt off the dynamo pulley. When  
the cells have discharged to a certain extent  
the hydrometer falls, makes another contact,  
which brings the other half-nut into action,  
causing the block to move back into its  
original position, and so restart the dynamo.  
Thus the storage of energy is made almost  
entirely automatic. It is estimated that the  
motor shown will, on an average, deliver  
25-horse-power hours a day; but until more  
data are available on this point, as well as  
the prime cost and the cost of maintenance,  
it will be impossible to compare the utility of  
the Rollason motor with that of others in the  
market.

THE village of Thorpe, close to, and,  
indeed, forming practically almost a  
suburb of Norwich, is the subject of a report  
as to its sanitary condition, presented to the  
Local Government Board by Dr. S. Monckton  
Copeman, from which it appears that Thorpe  
is in a very discreditable state in a sanitary  
sense, so much so that the large town adjoining  
may well feel also a practical interest in  
the matter. Part of the evil, the state of the  
River Yare near Thorpe, commenced when  
the Great Eastern Railway Company, in 1842,  
obtained power to make a new cut through  
a loop of the Yare, but with no obligation to  
dredge or keep clean the old river, the  
current through which was mainly diverted  
through the new cut. Hence an accumu-  
lation of stagnant water and refuse in the  
old arm of the Yare, close to Thorpe village.  
In addition to this, we find that Thorpe is  
without any proper system of drainage;  
that the water supply of the village is derived  
for the most part from surface wells, usually  
by means of pumps rudely fashioned from  
hollowed-out trunks of trees, the majority of  
which wells are not efficiently protected  
from percolation into them of soakage from  
cesspools and privy middens; and that where  
the water of these wells has been examined  
analytically, it has been generally condemned  
as unfit for drinking purposes. Nevertheless  
the wells have not been closed, no alterna-  
tive supply having been provided. The  
Norwich Waterworks Company could easily  
extend their mains to the village, but the Rural  
Sanitary Authority have postponed action, in  
the hope that a supply would be carried to the  
County Asylum, which is situated in the  
parish, and that thus the cost to the  
Sanitary Authority of the introduction of the  
company's water would be lessened. In  
some places notices had been fixed to the  
local pump that the water ought not to be  
drunk except after having been boiled;  
notices mostly defaced and no doubt entirely  
disregarded. There is not any public sewer  
at the present time in the village. Cesspools  
have for the most part been built on a lower  
level than the houses to which they are in  
relation, this practically meaning in all cases  
that they are nearer than the houses to the  
river, into which, indeed, in a certain number  
of cases, their overflow pipes directly  
discharge. There is a dispute between  
Norwich and Thorpe as to which of these is  
bound to keep the bend of the Yare clean,  
the Thorpe authorities declaring that it is  
polluted by Norwich sewage; the Report  
implies that both have a duty in respect to  
it, but that this fouled bend of the river is  
by no means alone answerable for the low  
sanitary state of Thorpe. The wretched and  
disgraceful state of drainage and water  
supply in Thorpe, and the manner in which  
the ground is honeycombed with badly-  
constructed cesspools, are evidently at the  
bottom of the mischief.

WHEN Princess, afterwards Queen,  
Anne removed her son, the Duke of  
Gloucester, from Lord Craven's house at  
Bayswater to be nearer the gravel-pits of  
Kensington, for sake of the child's health,  
she, with her husband, tenanted Campden  
House (see the *Builder* of March 4, 1893). For  
accommodation of the household an addition,  
called The Elms, was made—and some say



after Wren's designs—on the west side of Campden House, which had been built about sixty years previously by Sir Baptist Hicks, first Viscount Campden. The Elms was subsequently named Little Campden House, and converted into a separate residence, whereof the lease is at present for sale. It can boast of some famous occupants in later years, having been the home, in turn, of the Duchess of Cumberland, Sir H. Calvert, A. E. Egg, R.A., Alfred Wigan, and the late Vicar Cole, R.A.

WE read that the Friary, an ancient property in Lichfield, has recently been sold. It is situated near the city clock-tower, occupying the site of a convent founded by Alexander de Stavensby, Bishop of Coventry and Lichfield (obit 1238) for Franciscans, a few years after the first arrival in England of members of that religious order, *temp.* Henry III., and being contemporary with Grey Friars (Christ Church, Newgate-street) in London. The Friary was rebuilt, as a dwelling, in 1545; in 1700 it was devised for certain charitable uses. Harwood's book (4to, 1806) upon Lichfield and its antiquities, contains a "true and perfect platform" of the entire property, as reduced to scale, from a plan made in 1638 by John Hill, its then owner. That work also mentions that in the house existed a chimney-piece bearing the name of Gregory Stonyng, to whom the estate passed after the Suppression, and who, it appears, built the house. Remains of the old walls, foundations, &c., have been discovered from time to time, amongst them, in October, 1746, the grave-stone, bearing a carved cross fleury, with an inscription to Richard the merchant, which was illustrated in the *Gentleman's Magazine* at the time. The Duke of Cumberland fixed his head-quarters at the Friary when the king's army occupied Lichfield during the Rebellion, 1745-6.

AMONG the minor exhibitions now open one of the best is Mr. Wyllie's series of water-colour drawings made in a year's yachting in the West Indies, Atlantic, Mediterranean, Solent, and Thames. Mr. Wyllie is one of the very few artists of the day who is equally good in his treatment of the sea and of the ships that go upon it; for it is curious that one or two of our most renowned sea-painters do not seem to understand shipping, and never venture on it except in the shape of distant vessels on a small scale, which are even then often manifestly unsatisfying to the nautical eye. In this collection Mr. Wyllie has given more attention to the sea for its own sake, exclusive of vessels, than he has usually done, and some of his seas are exceedingly fine; we may mention especially 36, with its "long Atlantic waves," 40, 41, 48 and 50, and 55. The catalogue takes the pleasant form of a little story or diary, with the numbers of the pictures noted in the margin as we proceed. Altogether, it is a charming exhibition, from which one comes away with the mind full of fresh seas and wide spaces of air. At the Society of Fine Arts are Mr. F. Goodall's pictures of Egypt and the Valley of the Nile, an interesting collection of studies of local effect. At Messrs. Arthur Tooth & Son's Gallery the main attraction is Roybet's large picture, "Propos Galants," which was in the Salon of last year; it is really a colossal *genre* picture, showing wonderful power and reality in the painting of all the various details, in a broad full style; one can only regret that so much talent should be expended on such a coarse and brutal kind of subject. Among other contents of the same gallery are a first-rate example of the art of M. Gallegos, the painter of cathedral interiors and choirs; Sir F. Leighton's "Farewell"; Mr. Riviere's "The King's Libation"; one or two large works by Mr. Peter Graham, and other works by Mr. Wimperis (a very fine one), Mr. Leader, M. Sadé, M. Seiler, &c., a collection containing a good deal of interesting

#### THE ARCHITECTURAL ASSOCIATION: BASES OF A SUCCESSFUL ARCHITECTURAL PRACTICE IN THE TWENTIETH CENTURY.

THE ordinary fortnightly meeting of this Association was held on the 13th inst., in the meeting room of the Royal Institute of British Architects, 9, Conduit-street, Mr. E. W. Mountford (President) in the chair.

The minutes of the last ordinary and special meetings were read and confirmed, and several gifts were announced to the library, votes of thanks being passed to the several donors.

The President announced that Mr. Weedon's class for water colours commenced on the 21st of this month, and he hoped there would be a good attendance of students. The members would also have seen that the *Soirée* would be held on May 4.

Mr. W. Howard Seth-Smith then read the following paper, entitled "Bases of a Successful Architectural Practice in the Twentieth Century."

My subject is a well-worn—shall we say a threadbare one? For this I crave your pardon, but still hope that its perennial and vast importance, and perhaps a few new points of view which I shall take this evening may invest it with some life, interest and usefulness, and may promote discussion.

Architecture requires four qualities in its creator:

1. Common sense.
2. Thoughtfulness.
3. A cultured sense of beauty.
4. Skill in expressing this by drawing.

Modern engineering is the product of common sense, thought, and skill in drawing without the sense of beauty, and is therefore not architecture, in spite of Mr. Beresford Pite. The public have plenty of common sense, and engineering is accordingly the most popular profession. The public is in sympathy with, where it does not create, the characteristic conditions and tendencies of the age, and hence the inexpediency of the devotion to antiquated ideas which has largely contributed to alienate the public from our profession.

If we would be successful architects we must above all things adapt ourselves to these characteristic conditions and tendencies of our own day. What are they? Firstly. The worship of mind rather than of money or of art. It is pre-eminently the age of science, and we owe to the architect who, in the exclusive pursuit of that which as artists we all love best and would fain devote our whole time to, overlooks this fact.

The result of this worship of mind is an immensely increased demand for education, especially in professional men, with the inevitable result that those who intend to excel (I am not referring to men of special natural endowments; we may safely leave genius to take care of itself; I am arguing for men of average ability, this class including the vast majority of us) must be prepared to prolong their infancy in proportion to their determination to succeed. I use the word "education," of course, in its wide sense of expression of the mind in many directions, and in as great a degree as is practicable. Non will, I think, dispute this tendency. The formation of all professional societies is a concession to this condition of things.

The outcome of this tendency is the demand for some means (other than that of experience acquired by practice) of ascertaining the possession of superior culture as entitling to its confidence those who profess to advise the public. The only means yet devised is public examination of our students and due registration of the result. The decision in favour of examinations, in spite of the drawbacks of the system, is as general as is the opinion that the early training for all professions should be as wide and general as possible, the specialist study thus being better grounded and pursued more intelligently and safely. The election of experienced practitioners to membership of societies may have sufficed, in the past, as a rough-and-ready test of qualification, but much more is demanded nowadays. This is clearly seen in the establishment on all hands, by professional bodies, of examinations as a condition of membership.

A second phenomenon of our times is the reduction of large fortunes and large incomes, the distribution of money, and the consequent probability of our patrons consisting in the future more largely of the non-cultured and non-artistic class, a class which affects art, but knows little or nothing about it, but in my experience is willing to be advised and led.

A third condition is the distribution of means of

culture by high-class schools, University Extension courses, good provincial art libraries, technical schools, cheap travelling, &c. The provincially trained architect may by these means in the future as good a man in art and perhaps in respect to general experience as his metropolitan brother, and will be consequently more largely employed in important undertakings.

The teaching of these considerations is therefore that the public, first of all, requires us as architects to be thoroughly qualified all round, masters of the various practical details of governing the building trades, critics and directors of all departments of building, experts in building law, &c.; they further teach us that we must do some means of letting the public know that we are so qualified. I know many of my art critics will cry out I am degrading our art by a statement; but I make it emphatically, and make it in the interests of art as I shall endeavour to prove.

I would ask all those who appear to be in opposition to this view to answer candidly the following questions:

1. In spite of some little improvement does British public love and is it able or willing to reasonably for art in our work? (I am careful that good architecture need not be on the contrary, it is generally less so than bad, owing to its detestation of display and love of invention, but it would be absurd to argue that it costs no more than the purely utilitarian.) Addressing the Liverpool Art Convention only about six years ago, Sir Frederic Leighton as you may recollect, said: "Our country have no adequate perception of the place of art as an element of national greatness; they do not count its achievements among the sources of national pride; they do not appreciate its importance in the present day to certain branches of national prosperity; while what is excessive receives from them honour and recognition, is ignoble and hideous is not detested by them, is, indeed, accepted and borne with a acquiescence; the aesthetic consciousness is with a living force impelling them towards beautiful, and rebelling against the unsightly."

2. Secondly, I would ask, do you profess to be censor and dictator in the complex technical practical matters in connexion with your buildings? If not, you will not, at any rate, demand that your clients remunerate you on this standing.

Is not the reason of our employment frequently the utilitarian benefit our skill planning and our knowledge of building business will ensure? And is not the fact that an architect is so often not employed to advise in considerable building operations due to the fear of his ideas enhancing the cost, or perhaps to the suspicion (alas! in so many cases the reasonable suspicion) that his training in practical building is not equal to that of the builders?

The supreme problem before our profession is therefore, how to establish public confidence in our fitness to be the guardians of our clients' interests. This cannot be done by appealing to an instinct for art which does not exist, but it will result from an establishment of a conviction that we have enjoyed a lengthy training, and therefore possess a superior knowledge of those departments of our work which the public do appreciate and must and will have. It is folly to reckon without your hosts, many among us are endeavouring to induce students to do, forgetting in their laudable enthusiasm (which the young architect is only ready to catch, and, through want of experience to magnify to a perilous degree) for artistic details that they happen to have been the lucky small minority who are employed by the highly cultivated and wealthy few, while those who address will have in the vast majority of cases struggle with the difficulties and disappointments of a more ordinary practice, a very large proportion of which will consist of utilitarian work.

In connexion with the incidental difficulties and disappointments all architects must meet with must relate an anecdote in connexion with legal profession which would apply with a point to our own work. As a hint to students on the subject of charges its application may be more questionable. Some of you are doubt acquainted with the Scotch term "fash."

Sir Edward Watkin was going through a lawyer's bill of costs, and coming upon the "to fash, 30s.," was puzzled. Sir Edward, who knows his way about pretty well, felt completely floored. He either sent for or called upon a solicitor, who happened to be a Scotchman, asked what the charge 30s. for fash meant. "What is fash?" The lawyer replied: "I



papers, things you can't carry in your head, general mental anxiety." What a long bill our architects might present!

The tendency of the agitation which would be architecture "on the same footing as sculpture and painting" will, if persisted in, involve more and more of our work into the hands of firms of builders who ostentatiously undertake to do the architectural designing as well as the contracting, and thus to lead up to a system in which prevails in parts of the Continent which the public employ the builder and the architect.

Supposing we can attain our object as a profession and win a much more general respect and precedence in our work, will not the result be nearly more beneficial to the progress of art than any improvement we can hope to attain by giving a qualification which is not yet appreciated by the majority of our employers?

It is indeed now being done to repair the damage we have suffered in the past, and still, from our hap-hazard training of young architects. The curriculum of the Architectural Institute is, to my mind, by far the most useful and most promising of these efforts, for the reasons, that it encourages and supplements an important pupilage system, and that it is not based on theoretical educationalists but by architects who ought to be able to do as to the subjects most required and the pre-eminence to be given to them.

It is all made no apology for referring more at length to a great controversial subject of examinations as a test of training. Apart from the obvious incentive they provide to systematic study, the public demand them as the only reliable method of enabling them to ascertain whether a professional man has had a proper training, and I have yet to see urged any reason to warrant the exclusion of architecture from compliance with this demand. The most objection hitherto urged appears to be that engineers have never found it necessary to give a compulsory test, but the very essence of an engineer's calling obliges him to have a high technical and practical training, whereas the essence of ours constitutes a temptation to those interests to protect which our clients fully employ us.

It is emphatically that, in the interests of art, that we be thankful to the Institute for its establishment of a system of examinations. To give, improve, and make them general should be our aim. Some of us may not have realised its existence is threatened, but to my mind the decision of the Institute in favour of giving an art examination as alone qualifying for membership of the Institute appeared to be a blow struck at the whole system of the various examinations. That decision must inevitably involve injustice to the Associates if obligatory qualification for Associateship by examination is still to be insisted on. Men who pass the general examinations compulsorily for Associateship, necessitating four years' hard work, can now attain the higher distinction of Fellow by the mere fact of so many years' practice and in the production of some building of more or less architectural merit. That this decision was urged and passed by the exertions of the majority of the more artistic men in the Institute I admit, but one cannot shut one's eyes to the logic of the decision. I believe it must either in electing the Fellows only from the same class; in the election of Associates on the same test as the Fellows; or perhaps in giving the title of Fellow in future only upon architects who have specially distinguished themselves in the province of art.

As to the improvements of the examinations, neither the place nor the occasion to go into such a question, even were I able to do so, and I will content myself with the fact that the British public believe in a practitioner rather than in a theoretical training, that a training system must be by all means discredited, and the weakest men must be admitted. Also my conviction that the of honorary examiners can never work properly, though I appreciate as fully as the great services hitherto rendered by gentlemen.

I venture any further, and say a word of registration? If so, I would ask, what the Royal Institute of British Architects society whose object is the registration of qualified men? Would that its principles of obligatory tests might be applied to the profession at large. Of course this can only be (oh! terrible word) by an Act of Parliament. I believe that such a measure might be

drafted by the Institute as would obviate the main objections, whether just or not, urged against the present Bill. Such a measure promoted by the Royal Institute of British Architects would become law directly our legislators found time to deal with practical politics; the result would be to exclude untrained men from calling themselves architects, and so under false pretences obtaining work which only a highly trained person is capable of performing, and would put a stop to a state of things which has indubitably brought our craft into disrepute. And why should we not anticipate that as great an improvement would eventuate in the quality of the profession generally as has taken place in the ranks of the Institute as a result of its examinations, and that with the growing popularity of the profession art would begin to flourish and improve?

Many here will remember what the able Chairman of the London County Council said in this room during the discussion on Mr. Collard's paper. Mr. Hutton said that: "In his judgment, as a layman, he considered that the architectural profession suffered greatly from being an open profession. He might be wrong, and if so they would correct him. There was no obligation for a particular course of study, and therefore their profession might be called an open one. He thought that was a grave disadvantage, because he regarded, as he had said, the responsibility of architects as very great." Men generally believe in a great and well-organised profession, and expect great things from it, but they suspect an ill-trained and dislocated class such as the profession of architecture has hitherto been. It may also be asserted that a well-organised profession tends to produce great men.

I am anxious that what I have sought to urge in this paper should not be misunderstood to discount in the smallest degree the art qualification. This must be in any system of training the main thing, but my point is that the man who commends himself to his *clients* as thoroughly qualified to guard those more practical interests which are paramount in the public mind, will, if he be also a qualified artist, have many more opportunities of producing architectural beauties than the man who, by parading his contempt for much of the work which properly appertains to building, creates distrust and even aversion in the mind which cares not for his art, but which can generally be led to understand something about it, and thus ultimately to admire it.

We London men are so apt, too, to forget country architects, who, were they not men of very general practice, could not possibly exist; and is our training and testing to be solely for the benefit of our great cities?

Our wisdom will be best shown in endeavouring to meet our clients' wishes, even when they may appear to us eccentric, prejudiced, or ignorant. Nay, may we not rather regard this as among the ethics of our calling, and as important as honestly estimating and fearlessly reporting the cost of projected work and many similar somewhat unpalatable duties? A conscientious and a thoughtful attempt to do this will generally result in unexpectedly original and beautiful features.

A practical suggestion was recently made by the *St. James's Gazette*, which I believe would result in good to architecture, and the *Daily Graphic* noticing the remark, observed: "Some time ago we advocated the desirability of the names of architects being placed in some prominent position on the buildings for which they are responsible."

The *St. James's Gazette* has now taken this matter up. It says, speaking of a modern building of great excellence, "while the frontage is placarded with advertisements concerning what we do not want to know, namely, who is the builder, the electric light fitter, &c., &c., not even a tiny tablet records the name of the artist in whom the public is most interested. If all our buildings were properly labelled, it would be a distinct gain from an educational point of view." If all architects felt that the erection of a work inevitably exposed them either to public opprobrium or esteem they would generally be much more careful of their reputation than they are at present.

There are many other essentials to successful individual practice which, when I decided early in the session to speak on this subject, I had in my mind to refer to; many of these have, however, been so ably stated by readers of other papers, particularly by the President, Mr. Beresford Pite, and Mr. Collard, that I felt obliged to confine myself to the broader politics of the profession. I do not regret that circumstances have led me in this direction, as it has

always appeared to me that all other professional questions sink into the background as compared to that of how best to satisfy the wants and to inspire the confidence of those who desire our advice, and if my reasons for adopting as the best means to that end the three main principles laid down in this paper, namely (a) a prolonged systematic course of study, (b) examinations as a test and public proof of knowledge, and (c) the closing of the profession against unqualified men. If these reasons should appeal to your minds as sufficiently strong to warrant the adherence to these principles of those who are destined, as you are, to control the course of professional affairs in the near future, I shall feel that a distinct advance has been made towards the elevation of our art to its proper place in the affections of the people of this country.

Professor Kerr, in opening the discussion, said that, though congratulating Mr. Seth-Smith upon the extremely gentlemanly tone pervading his observations, he might be excused if he followed the matter a little further. He did this for another reason, for when a man had arrived at his time of life, it was his duty to point out to those who were aspiring to attain usefulness as public servants what they should have the opportunity of being informed of by their seniors as the result of their experience. The twentieth century was not far off now, and when it had once begun it would have one hundred years to run; but although they might not be able to predict what would be the state of things at the end of that century, they might venture upon saying something with regard to what would probably be the character of the business in the first quarter of the century. He remembered the time when the chair of the Institute was occupied by Sir William Tite, who was a man with very broad feelings in favour of art, science, and literature. He could recollect Sir William saying that, when he was a young man, he could count the architects in London upon his fingers. Now, that was not so very long ago, and if the profession was to progress for another fifty or seventy years as it had done during the last seventy years, where was it to end? That being so, what the young men had to contemplate was this: they rightly judged themselves to be the representatives of the coming generation of architects, therefore, what would their work be, and how would they perform it? The work of an architect in practice, leaving aside all transcendentalism for the moment, consisted of three parts, viz., art, science, and the practice of business. Could they, then, advise the young men of the profession as to what they had to look forward to and prepare for under those three heads? He thought they could, and he would take these subjects in the reverse way in which he had stated them, beginning with business. English people were devoted to a businesslike consideration of everything they had to deal with, and when an Englishman employed an architect, in ninety-nine cases out of a hundred it was in order to see him through a building transaction safely; the hundredth case might be an exception to the general rule, and there might be some other object in view. Now, to see a client safely through a building transaction was no light task. Those who were distinguished artists or men of science in the architectural profession, would forcibly aver, when they had arrived at mature years, that the greatest difficulty they had had to contend with was that which consisted in carrying their transactions through creditably to all parties and satisfactorily to the client. In order to understand business as an architect should, a young man must devote himself to what were called practical matters. He did not think he would be wrong in saying, as a matter of prudence, that the first thing the young architect ought to devote himself to was the acquisition of that knowledge which would give him expertness in the transaction of his business, leaving art and science for the moment out of view. It would be needless and almost impossible for him to give a catalogue of the various elements of architectural business, but everyone who had had much experience knew very well that those elements were exceedingly numerous, and that, in order to acquire a knowledge of them, a young man must condescend to devote his attention strictly to that kind of work which he saw in the office. This might appear sometimes to be beneath his dignity, but it would be found to lie at the root of his success—the copying of letters and specifications, the keeping of accounts, and the keeping his ears continually open to all that was going on in respect to the transaction of business. Then as regards science, the architect,



speaking generally, was regarded by the engineer as not being a sufficiently scientific man; in other words, he was not sufficiently a mathematician. That, however, was a defect which was easily cured, and the young man might very well be advised to devote a good deal of his attention to mathematics, and to acquire the habit of calculation. There was no very great difficulty about it, and if the young man did not happen to have learned mathematics at school, he should be recommended to take up the subject, and he did not think he would be frightened at it. Take, for example, the scantlings of timbers; a young man had only to look into the table to find exactly what ought to be the size of the joists, and certain spans for the scantlings of rafters and purlins, and so on. But that was not the way to do it; he ought to know how to make a calculation off-hand, without reference at all to the book. He did not say that the tables should not be used, for the sake of saving time, but the young man ought not to be unable to make a calculation for himself. The science of building, of course, went much further than mathematical calculation, and the remarks he had made applied equally to all scientific questions which might be involved. An architect ought, for instance, to study geology and chemistry, and to make himself master of the superficialities, at least, of all sciences connected with the work he had to do. In the coming generation he believed, referring to the matter of business again, that the public would expect the architect, whether registered or not—for that would make no sort of difference—to be thoroughly well qualified, and better qualified than many were at present, to attend to practical matters. The public would expect the architect presently to be also more scientific than he was at present. The education of the public was advancing rapidly, and, in ordinary conversation with men of a practical turn, who happened to be in any way connected with building, he could not help perceiving that they knew much more of the superficialities of science than their predecessors did twenty or thirty years ago. Turning to the question of art, it was always a difficult question, and one frequently discussed in that room both by the senior Institute and this junior Association; in fact, it was a question which might be discussed for ages to come and never would be discussed too much. It must be remembered that the English were not, by gift of nature, an artistic people. That had been discussed over and over again by those who thoroughly understood the comparison between the intellects of different nations, interested in art and other matters of intelligence, and it might be considered to be settled that the English, being a Teutonic race, were inferior, as regards their natural construction of mind, to the members of the Latin races, such as the French, the Italians to a considerable extent, and the Spaniards as they used to be, with reference to the artistic gifts of nature. At the same time, if he might venture to make a suggestion, which he had frequently made before, he would say that the turn which the world was taking would bring about, in the course of another fifty years, a change in the artistic development of Europe at large and of America, which might bring the Teutonic race to the front. If that was at all likely to be the case, then the young men must prepare themselves for it. English society at large was becoming more artistic, in spite of its deficiencies as regards natural proclivities; therefore, architects must be more and not less artistic than they were. He did not say that they should devote themselves to art in the Bohemian manner, as some of them did, by indulging in ferocities rather than in common sense with regard to the claims of art. At the same time, even that was part of the development of human nature; it did not hurt anybody much, and it amused themselves. But he was speaking of common-sense art, which the public wanted to have, and beyond which they did not generally wish to go, and the architect, who was to make his mark in the next generation as a successful practitioner, would have to understand that more and not less art would be required of him. The general tendency of the paper might be considered to be such as to require the apology offered at the end, that it was not to be understood as depreciating art. Not only was it not to be so understood, but they were not to allow that anyone, in these days, could be so understood, without prejudice to the profession at large and to the national interest in it. The quotation from Sir Frederic Leighton seemed, like everything he uttered, to be exceedingly sound and weighty. Sir Frederic pointed to the practical inclination of Englishmen at the present moment towards the sober advancement of practical

art. This was not evidenced in architecture alone, but was most conspicuously displayed in the arts which were less prominent. When one looked into South Kensington Museum and reflected on the multiplicity of artistic effort there displayed, one saw how the English intelligence of the present moment was steadily and resolutely advancing. Architecture, therefore, must not be behindhand as regards art. The peculiar position of architectural art at the present time might deserve a moment's discussion. The fault, as it seemed to him, of the present school of architecture was that it lacked dignity. Now, the French were never behindhand in dignity. We, at the present, were emerging, and he thought with considerable success, from a somewhat unfortunate condition of things, brought about with the best intentions by the secular Gothic revival, now done with; we were emerging from that somewhat dreary condition of things in practice towards a brighter sphere of design. We could not, however, expect to perform, by a mere hop, step, and jump, a great historical movement. We were not at the very beginning of the movement; we had advanced considerably, but not so far as we would presently find ourselves advancing, and, therefore, if there was anything that seemed fantastic and bric-a-brac, and more amusing than imposing, in many of the present efforts of architects, let us take credit for at least being on the move in the right direction. The popular style of architecture at the present day was a step tending towards something which would be more delicately designed, and much more imposing. There would be more dignity and more majesty. The detail would not be frittered away, but the system of design would possess more breadth and repose. Young men must not study bric-a-brac, because that would not last long, nor mere finesse and fastidiousness, as these were all mere ephemeral matters. They must devote themselves more to the study of those examples of architecture that were really grand. The public of this country would appreciate grandeur, repose, dignity, and the evidence of sound proportions and thoughtful device, and if they could make an impression on the minds of the young men in that direction, they might perhaps be contributing to their advancement in a very practical way. In conclusion, the young men must understand that they had embarked in the acquisition of a profession of great importance and one contributing to the mind of the practitioner immense pleasure and delight. It was a profession which could not be acquired except by the exercise of industry, diligence, and perseverance. There was a great deal to be learned and much work to be done day by day, and all he could say, as an old man, was that any one of them might believe that, by putting his shoulder to the wheel resolutely, and not calling upon Hercules for help, but depending on his intelligence, even if it was not of the highest order, and supplementing all deficiencies by perseverance, he might not merely attain to the condition of a skilled practitioner, but he might acquire a niche, though it might be a small one, in the artistic history of his country.

Mr. Albert Goodman, in proposing a vote of thanks to Mr. Seth-Smith, said that one of the ethics of the profession was the question of who "paid the piper," and it was important to meet successfully the wishes of those who wanted a small thing done, because later on they might require something larger.

Mr. E. Doran Webb, F.S.A., disagreed with the last speaker. He had never found anything gained by not following the first and best course. His advice was to do the best they could for their client; but, on the other hand, not to let him influence them so as to prevent their doing what they thought would be the best.

Mr. Thomas Blashill hoped that none of them had come into the profession without a decided liking for it, and an interest in every matter connected with it, for unless that was so, there was a very bad chance of their doing well. One of the great wants he had detected in his career—and great wants he had with him—was the want of painstaking accuracy in the examination of everything that came before them. If they took an interest in all these matters it ceased to be drudgery. It was a long time since he had read the essay on "The Sublime and Beautiful," but in dealing with the question of taste he believed it was there stated that, nine times out of ten, people suffered, not from the want of taste, but from the want of knowledge. In these days of examination, when they were labouring at all the different subjects, and men managed just to scuttle through, they must not be surprised if they did not turn out to be so successful as they would wish to be. From the time the young man

went into the office, he ought to be as close in connexion with business as he could. It was common thing to hear the expression Prof. Kerr had used, in the ordinary sense, that there were three requisites—art, science, and business. But he confessed he had never been able to do much in the observation. Was not science everything with which they equipped themselves for business? Science was registered, catalogued, and systematised knowledge; everything the man did was the practice of art. The one idea he wished to impress on them was the attaining of an intensely accurate knowledge of all that was relative to the business. From that everything else came, and if a man attended to that for the long run, he would not only spend a pleasant existence in the profession, but, in all probability, it would be a useful and profitable one.

A member complained that the names of architects were seldom put on the buildings, scarcely ever mentioned in the papers.

Mr. S. B. Beale said that the reader of the paper had given them two bases of successful architectural practice in the twentieth century, the most important one being the more capacity to be attained by architects. It was to him that the present century had produced a man more than another—*viz.*, the speaker. There were men who made drawings for the Academy; they had men who could tell to a shilling what the cost of a building would be, and had the man who could make construction working drawings; and the man who drew specifications; but had they the men who did all those things? He was pleased, then, to hear Mr. Seth-Smith emphasize the advantage of the all-round man. It seemed to him that other point of very great importance, which came to him, and, possibly, to a great many as a bolt from the blue, was the subject of tradition. They had thought that Mr. Seth had cast off his old cloak when he came to them, but there appeared still some of the leaven in his convictions. It was not for him (speaker) to combat those doctrines. Their merits were pretty well known, but the change in their minds was that Registration would do them all to one dead level of mediocrity, the openness of the profession would be closed by it. They had sacrificed a great deal in giving up their voluntary system in the acquisition for a curriculum which, more than anything, hampered their individuality, but they still thought a man should be enabled to make his mark by his own individual effort, and, therefore, they were opposed to Registration.

Mr. A. Wallace Rimmington said that it was not to be an artistic nation, but we were becoming so. He regretted to hear it said that we were hopeless in an artistic point of view, but it seemed to him that there was more art in England than people would admit, and many more artists, especially among the young men. When he returned from his own practice, when he was always a refreshment to him, as far as architecture was concerned. There were a great many buildings rising here. This was not the case in Italy; in Germany it was only happening in few places, and in France the question was open one; but in England there was no question about it, it seemed to him, when a man came at buildings from a picturesque point of view. Then again, modern English buildings were more pleasure than the modern buildings of any other country. In every direction could be seen a strong artistic revival in England. Their strong sense amongst the English as regards public art, and it seemed to him that was very great hope indeed for him that was to get on.

Mr. Brodie remarked that if the architect designed a building for 150*l.*, when his client prepared to spend 200*l.* upon it, he would

Mr. F. T. W. Goldsmith (Hon. Sec.) said the vote of thanks, and compliments to Mr. Seth-Smith on his paper. They should be surprised at the writer's advocacy of registration, because they knew he had not yet cast his mantle of registration, whatever he might under the influence of the Royal Institute of British Architects and the Architectural Association. He seemed, however, to have amended his first advocacy of the question, for, in the course of the paper, he found that it was much that the interests of the public would be better served by registration, but that architectural practice would be improved by the registration of architects on the same footing, in estimation, as the legal and medical professions. He thought it would be well if the architect



top his social qualities more. The architect, the nature of his art, needs to some extent to be secluded, and that militated much against him obtaining such recognition and popularity as to the lot of others, less deserving but better known, like doctors and lawyers.

The President said they would be all agreed Mr. Seth-Smith's paper was a very interesting one. It was one which should have provoked a deal of discussion, but somehow the speakers tried to have started away from the subject, proceeded rather to give valuable advice to architects as to what they should do at present moment. What the twentieth century had in store for architects was difficult to say, but he believed there were good times ahead. He thought the public as a whole wanted good architecture more and more every day, and that London architects in particular had a good time before them, when the City Council ceased from troubling, and gave a little more freedom. But where the hope of London architects must lie, as regards buildings in London, was in the democracy, who desired useful buildings more than any other class of men, because it was about the only form of art would be likely to possess. Mr. Seth-Smith said that the provincially-trained architect in the future be as good a man in art as his metropolitan brother. He was bound to say, however, that the provincial architect would often be a great deal better. Metropolitan students learned a great deal too much books, while the provincial students spent time upon the actual buildings. The whole tendency of the present day seemed to be to have of practical experience for architects, and Mr. Seth-Smith hoped that the examinations would produce those men. He (the speaker) took the opposite view, viz.: that examinations would keep those men in the background. The result, instead of giving so much time to little bits of detail, to which attention had been devoted, ought practically to spend his whole time in design. The knowledge of cost and the things would come by experience, and were a man of common sense he would pick them up. It seemed to him that architects, before all things, should have design and nothing but design, and Professor Kerr had said, the tendency in the future would be for architects to strive after simplicity, and good proportion in their designs. He did not agree with the Professor at he said as to the Gothic revival, which he believed had done a great deal of good. It left its mark behind it, and he believed twentieth-century architecture would be the result of the Gothic revival and of the fading Classic revival, and that, out of those two, a twentieth-century style would gradually grow itself, which would probably be equal to anything which had gone before. It would be that which architects would study the requirements of their times, and not go back to the revival of England or Classic Greece for their models. They ought to take advantage of the materials of which they had a choice, and there was no other generation ever had. They did to use iron and steel, and all the other materials in the way for which they were adapted, and which would suit the requirements of the twentieth century. Professor Kerr had said to the dreadful outlook as to the increase in number of architects, but the amount of work done by architects was not more than 10 per cent. of the whole that was done, and there was no reason to suppose that a large percentage of the work was now done without the help of architects. It was in the hands of the architects of the future, and he hoped that registration would not be put to the public or the architects in the slightest. The amount of experience necessary to be a man to be registered would be of no value to him or to the public, but would, on the contrary, give a certain amount of standing to him, which, in the eyes of the public, would be equal to other architects of far greater experience.

A vote of thanks was then put and cordially received.

Mr. Seth-Smith, in replying, said that he had with the question of registration, although there was a great deal of opposition to the Association. In spite of that, his own views were so deep and genuine on the subject, that he felt in the interests of art, which he believed the profession to which he belonged, that it would not be right if he did not place those views before them, though he was perfectly aware that they would not be very popular. The discussion, the President had remarked, had somewhat

wandered from the substance of what he wished to convey, but he thought, on the whole, it had tended to support his principles. Mr. Axel Haig had in conversation expressed his agreement with him that it would be in the interests of art and architecture if they were so qualified as to commend themselves to the British public in the way he had suggested. It had been said that it would be better to refuse a client's work if they did not agree with him. He did not think it had ever been the case in the history of architecture that the public had been led by the profession; they would find that the profession had always in the end had to adopt the view and the particular taste of the educated public. As to registration, a remark had been made that, in advocating this principle, he had changed his grounds, but this was not the case; he had sought to-night only to put forward the broader reasons. He would reiterate the advice, which the Honorary Secretary had given them, as to the necessity for brotherhood in the profession. If they were more like painters, who were always popping in and out of one another's studios and giving each other suggestions in design, &c., they would be immense gainers, and he hoped that the Association might tend to promote that spirit of brotherly feeling, so that they might arrange more frequently the visits of professional friends to their studios, as they now called them, and so gain advantage by one another's experience.

It was announced that at the next meeting the nominations of officers of the Association would take place.

The proceedings then terminated.

#### THE ARCHITECTURAL ASSOCIATION SPRING VISITS:

##### ST. PAUL'S CATHEDRAL.

ON Saturday last the members of the Architectural Association visited St. Paul's Cathedral for the purpose of inspecting the new mosaics, &c., which have been placed in the choir, from the designs of Mr. W. B. Richmond, A.R.A. The party was to have been met by Dean Gregory at 2.30 p.m. at the west door, but it was not until after 3 o'clock that the Dean, with many excuses, made his appearance.

Meanwhile the mosaics were inspected, giving rise to much difference of opinion; the craftsmanship, elaborately dwelt upon in the new guide, appeared to be more approved than the designs. The reredos has gained much in effect by being seen in a general surrounding of coloured architecture.

The new Jesus Chapel in the old apse attracted much attention. It has a new reredos, designed by Messrs. Bodley & Garner, and three windows of Renaissance type by Mr. Kempe. Here also is the Liddon Memorial, an altar tomb of Jacobean type, with recumbent figure. All the marble work in the apse is executed by Messrs. Farmer & Brindley. In the nave, the new position of the Wellington monument was a matter of general congratulation; it still lacks, however, the indispensable crowning statue of the Duke on horseback, to which the whole design leads up. On the arrival of the Dean, the party were taken into the old Consistory Court, and had the opportunity of inspecting the huge stone statues for the drum of the dome; four of these have been designed by Mr. Kempe, and executed by Messrs. Farmer & Brindley. The members then proceeded up the library staircase, near the south transept and along the triforium to the library, which is over the Consistory Court. Here were examined an ever-increasing collection of books and prints, relative to St. Paul's, collected by Dr. Sparrow Simpson, the Librarian. The model-room was reached across the western gallery, and great interest was taken in this model of Wren's original design, which is in capital preservation. The choir-room, close at hand in the north triforium, contains some interesting geometrical drawings by the late Mr. Ferrey, of Old St. Paul's, made up, we may suppose, from old prints. The party then proceeded up to the stone gallery, above the colonnade, from which the groups of Wren's surrounding City churches were well seen, and the members subsequently dispersed, after an interesting visit.

**HIGHGATE SANITARY MUSEUM.**—The students from the Westminster Technical Institute (which has been formed through the munificence of the Baroness Burdett-Coutts) will visit the Highgate Museum of Sanitary Appliances on Saturday next at 3.30 p.m. Mr. T. de Courcy Meade, under whose direction the Museum has been formed, will give a short address.

#### THE LONDON COUNTY COUNCIL.

THE usual weekly meeting of the London County Council was held on Tuesday at the County Hall, Spring-gardens, Mr. John Hutton, the Chairman, presiding.

**Land under Charing Cross Railway Bridge.**—The Highways Committee brought up an adjourned report recommending—

"That, subject to an estimate being submitted to the Council by the Finance Committee as required by the statute, iron railings be provided and fixed where required around the land used as a store-yard, on the Victoria embankment under the Charing-cross railway bridge, and that a close wooden fence be placed round the whole of the land on the inner side of and be attached to the railings, at a cost not exceeding 160*l.*; that the work be carried out without the intervention of a contractor; and that the plan and estimate be referred to the Works Committee for that purpose."

After some discussion the recommendation was agreed to.

**The widening of St. John-street, Clerkenwell.**—An adjourned report of the Improvements Committee was agreed to, recommending that, inasmuch as the Vestry of Clerkenwell is not prepared to contribute to the cost, the widening of St. John-street, between Aylesbury-street and Albermarle-street, be not at present undertaken by the Council.

**Shaftesbury Memorial Fountain.**—The same Committee reported as follows in reference to the Shaftesbury memorial fountain:—

"On November 21 last we reported that the height of the wall surrounding the Shaftesbury memorial fountain at Piccadilly Circus had been reduced as far as the plinth (*i.e.*, to somewhat less than a foot above the pavement level), and we recommended that the wall should be removed altogether, but the Council referred our recommendation back. We have again given careful consideration to the question, with the result that we are still of opinion that the appearance of the fountain would be further improved by the removal of the wall—an opinion which has been considerably strengthened during the carrying out of experiments with the supply of water for the fountain. The cost of removing the wall would be very small. We have not yet completed our experiments with the water supply, but we hope to be in a position to report at an early date. In the meantime we recommend—

"That the wall surrounding the Shaftesbury memorial fountain be removed, and that the work be done by the Works Department."

Mr. Campbell moved to refer the report back to the Committee. The fountain was utterly unsuited to the site, was a monument of absurdity in its present position, and, in his opinion, should be presented to the Parks Committee for erection in one of the parks.

Mr. Beresford Hope seconded the amendment, which was lost, and the recommendation of the Committee was then agreed to.

**Blackwall Tunnel Works.**—The Bridges Committee reported that the estimated value of the work executed at the Blackwall Tunnel up to the end of March was 268,773*l.*, of which the sum of 6,663*l.* represents the cost of the operations on the raised approach, the total value of the work carried out during the past month being 7,425*l.*

**Result of Legal Proceedings.**—The Building Act Committee brought up a report containing the following paragraph, the recommendation being agreed to:—

"The Council's appeal against the decision of the magistrate in the proceedings taken against Mr. G. Mitchell for having erected a house with its forecourt within the prescribed distance of the centre of Trinity-road, Wandsworth, came on before a Divisional Court on April 4. The court allowed the appeal, with costs, on the point raised, holding that a 'street' in Section 7 of the Metropolitan Management and Building Acts Amendment Act, 1878, was not within the exception contained in the proviso to the section unless it was actually existing for building before the Act of 1878, and that the words 'existing formed or laid out for building' in that section must be read with and as qualifying the word street, and adding that the Court did not see anything inconsistent with the present judgment in the case of *Ellis v. The Council*, relied on by the respondent. The magistrate was directed to hear evidence, and to decide whether the street was laid out for building before 1878. The judgment is of additional importance as being explanatory of the decision in *Ellis v. The Council*, putting upon that case the construction the Council contended for, and making clear a point which it had been deemed advisable to deal with in the new Streets and Buildings Bill. We are of opinion that when the case is heard by the magistrate the Council should be represented by counsel, and we recommend—

"That the solicitor be instructed accordingly."



*Building on low-lying land.*—The Main Drainage Committee's report contained the following paragraph, the recommendation being agreed to:—

"Under the provisions of the Council's General Powers Act, 1893, section 5, no person may erect or adapt any building to be used wholly or in part as a dwelling-house upon land the surface of which is below the level of Trinity high-water mark, except with the permission of the Council, and subject to and in accordance with such regulations as the Council shall from time to time prescribe with reference to the erection of buildings on such land. The Act further provides that a tribunal of appeal shall be constituted to consider appeals made by persons to whom the Council may have refused permission to build, or who object to the regulations or conditions imposed. This tribunal is to consist of three members, one to be from time to time appointed by the Council, one by the President of the Institution of Civil Engineers, and one by the Council of the Royal Institute of British Architects. The two last-mentioned have appointed Mr. J. Charles Cooke and Mr. Arthur Cates respectively as members of the tribunal. After conference with representatives of the Building Act and Public Health Committees, we are of opinion that it is not desirable that the member of the tribunal to be appointed by the Council should be a member of the Council. Dr. T. Orme Dudfield, medical officer to the Vestry of Kensington, has accordingly been asked whether he is willing to serve as the Council's representative on the tribunal. He has consented to do so, and we recommend—

'That Dr. T. Orme Dudfield be appointed as the Council's representative on the tribunal of appeal to be constituted under Section 5 of the Council's General Powers Act, 1893.'

As regards the regulations to be made by the Council, some of these have to be submitted to the tribunal of appeal, and we are not yet therefore in a position to put them before the Council.

*Highgate Archway.*—The Parliamentary Committee reported in respect of the Highgate Archway as follows:—

"The condition on which the Council resolved to seek powers to widen Archway-road and to reconstruct the Highgate Archway was that the cost of the work, estimated at 27,000*l.*, should, after the deduction of the sum of 1,000*l.*, be contributed by the Ecclesiastical Commissioners, be borne in equal proportion by the Council, the Middlesex County Council, the Vestry of Islington, and the Hornsey Local Board, according to which a sum of 6,500*l.* would be contributed by each. By the terms of the Bill, as deposited, no express limit is provided to the several contributions, and exception has been taken to this by some of the parties interested. We think it was not the intention of the Council that the Middlesex County Council, the Vestry of Islington, or the Hornsey Local Board should be called upon in any event for a larger contribution than 6,500*l.*, and we have instructed the agent to inform them that their contributions will not exceed this amount.

They recommended that the course taken be approved, and it was agreed to.

*Competitive Design for Working-class Dwellings.*—The Public Health and Housing Committee reported as follows:—

"On October 10 last the Council passed the following resolution:—'That it be referred to the Public Health and Housing Committee to consider the desirableness of inviting specially-qualified architects to send in competitive designs for artisans' dwellings.' We have carefully considered the above reference, and have come to the conclusion that it is desirable that competitive designs should be invited for some of the dwellings to be erected on the land in the Council's possession which is required to be devoted to the accommodation of the working-class. It is essential that the buildings to be erected on the Boundary-street area should be proceeded with with the least possible delay. The housing branch of the architect's department is already fully occupied with the preparation of the plans of the dwellings to be provided on section B of the area, and also on various other sites, and it will be some months before any fresh work can be undertaken by the branch. We therefore propose that designs should be invited for the buildings to be erected on a portion of section E of the Boundary-street area lying to the south-east of the area. We have carefully considered whether the competition should be open or limited, and we are of opinion that the end in view, *i.e.*, to obtain the best designs, will be attained in the surest way by limiting the competition to six architects who, by their previous experience and work, have shown themselves to be thoroughly competent advisers. As regards the conditions of the competition and the number and amount of the premiums to be paid to the competitors, we are of opinion that the sum of 50*l.* should be paid to each competitor, and in addition that the sum of 200*l.* should be distributed among the competitors at our discretion. It is proposed that the usual commission of 5 per cent.

should be paid to the successful competitor in addition to the sums mentioned. We recommend:—

'That, subject to an estimate to be submitted by the Finance Committee in accordance with the statute, the Committee be authorised to invite competitive designs from six specially-qualified architects for the dwellings to be erected on a portion of Section E of the Boundary-street area; that the sum of 50*l.* be paid to each competitor, and that, in addition, the Committee be authorised to expend a further sum, not exceeding 200*l.*, for distribution among the competitors at the Committee's discretion.'

Mr. McCall moved and Mr. Doubleday seconded an amendment to refer the recommendation back for further consideration.

On a show of hands the amendment was declared lost, and the recommendation of the Committee was agreed to.

The Council adjourned soon after 7 o'clock.

#### THE BUILDERS' CLERKS' BENEVOLENT INSTITUTION: ANNUAL DINNER.

THE sixteenth annual dinner in aid of the funds of this Institution was held on Tuesday evening last at the Holborn Restaurant, the President of the Institution, Mr. William Shepherd, occupying the chair.

The usual loyal and patriotic toasts having been honoured (Colonel G. H. Trollope responding for the "Army, Navy, and Reserve Forces"),

The Chairman rose to propose the toast of the evening, "The Builders' Clerks' Benevolent Institution." The Institution was, he said, founded in the year 1866, and its object was not only to provide donations to decayed builders' clerks and their widows, but also to provide for the orphans of builders' clerks. But, in his opinion, the most useful purpose of their Institution was to afford assistance to builders' clerks who were overtaken by misfortune—either by being thrown out of work or by being incapacitated from following their employment by illness or from other causes. There was no doubt that this kind of help had carried many of those who had been compelled to receive it over such periods of distress. A great deal of credit was due to those gentlemen connected with the Builders' Clerks' Benevolent Institution who had succeeded in carrying it on so successfully since the year 1866, and this in itself should be an additional recommendation to those who were able to help to do what they could for the Institution. They were doing a very useful work; the number of pensioners at the present time on the books of the Institution was seventeen, but that, as they would have gathered from his remarks, did not represent the whole of their work. The yearly income from the members' subscriptions was not sufficient to enable them to carry on the work, and they were therefore compelled to appeal once a year, and he very confidently did that night, to their friends to assist them by their generous help. The way in which relief was granted to those in need of it was above criticism, for every case was dealt with on its merits. While it was very desirable that, as far as possible, all builders' clerks should subscribe to the Institution, because in doing that they would feel an interest in its work, yet the benefits, he might add, were not confined to subscribers.

The toast having been very cordially received, Mr. W. R. Freeman, past President, proposed the toast of "The Architects and Surveyors," coupled with the name of Mr. C. J. Jones. In reference to the architects, he said there was no doubt that they were ready, as a rule, to acknowledge good work on the part of the builders. They were, moreover, usually glad to hear that institutions like the Builders' Clerks' Benevolent Institution were being kept up, but he wished that besides giving their donations they would present themselves at their board, and show by their presence that they were taking a real interest in the work.

Mr. C. J. Jones having responded, Mr. E. C. Roe proposed "The Builders," coupled with the name of Mr. Joseph Randall, past President.

Mr. Randall, in response, said that builders were often blamed for the work which they carried out; but it must be remembered that there were builders and builders, and certainly builders who carried out their work properly.

Other toasts were, "The Merchants," proposed by Mr. H. H. Leonard, and replied to by Mr. W. Masters; "The Past Presidents," proposed by Mr. E. Brooks, treasurer, and replied to by Colonel G. Trollope (who referred to the loss which the Institution had sustained since their

last dinner in the death of Mr. William A. C. last year's President); "The President," proposed by Mr. F. Hunter, and "The Visitors," proposed by the President, and replied to by C. L. Jones.

During the evening, the secretary, Mr. E. Wheatley, announced donations to the amount of 32*l.*

#### ARCHITECTURAL SOCIETIES.

**NORTHERN ARCHITECTURAL ASSOCIATION.** The annual meeting of the Northern Architectural Association was held on the 11th inst. at the Gallery, Newcastle, Mr. J. H. Morton (President) in the chair. Mr. H. B. Plummer (secretary) read the committee's report for the year. The report stated that since the last year meeting nine members, eight associates, and 10 students had been elected, making a total of 45 members, 45 associates, and 28 students. The committee also reported that progress had been made by the Association in other directions. Prizes for drawings had been awarded to Mr. M. G. Martinson and W. H. Featherstone, sketches, to Messrs. W. H. Reed and G. C. Whall; and for measured drawings, to Mr. C. D. Rochester and R. P. Twizell. The treasurer's report showed a balance in hand of 53*l.* 6*s.* 10*d.* The President, in the course of his address, said the interest of their meetings had been maintained and nourished by communications with the Institute and other associations, and lectures of a practical and instructive character had been given. On one point he might say with a feeling of regret, tempered, however, by a reasonable spirit of hopefulness. Their efforts to secure for their students a desirable connection with the Durham College of Science had been only partially successful. The obstacle, nevertheless, were not to be regarded as an irremovable character, and he ventured to say that his successor in office would have the good fortune of bringing matters to a satisfactory conclusion. It was with much pleasure that he had to present a memorial to Mr. Rich, their late Honorary Secretary, in order to mark their appreciation of that gentleman's services to the Association. Mr. Rich's connexion with the Northern Architectural Association dated, he believed, from the year 1875, when he was elected an associate; in 1883 he occupied the chair as President of the Association. In his capacity as Secretary, Mr. Rich had carried out the duties pertaining to his office with great care, mature judgment, assiduity; and the Association owed a great deal to his success in his skill and guidance. Mr. Rich having returned thanks, Mr. J. Oswald, F.R.I.B.A., was elected President of the Association for the next year, and the following gentlemen were elected upon the Council:—J. Cresswell, A.R.I.B.A., J. Morton, F.R.I.B.A., Vice-Presidents; J. Cockett, F.R.I.B.A., Hon. Treasurer; A. Plummer, F.R.I.B.A., Hon. Sec.; H. Harvey, Hon. Solicitor; Messrs. G. T. B. H. C. Charlewood, A.R.I.B.A., W. Glover, H. Rich, J. W. Taylor, F.R.I.B.A., C. S. Errington, C. E. Oliver, committee; Mr. W. Glover, Mr. J. W. Twist, Auditors.

**EDINBURGH ARCHITECTURAL ASSOCIATION.**—On the 7th inst., the members of the Edinburgh Architectural Association paid a visit to the buildings of the Edinburgh University Mound. Professor Geddes acted as leader, with the architects of the Hall buildings, Mr. Menbest Capper, A.R.I.B.A., and Mr. Sydney Mitchell and Wilson. After a visit to the small house, No. 2, Mound-place, where the Hall idea was first put into practice, the party proceeded to Ramsay Garden. In the new erection it is intended to provide for between thirty and forty students; the houses to the extreme west, and the western windows directly face the Castle, separate dwelling-houses, and will be taken possession of by families of professional gentlemen interested in the movement. Already the block overlooking the Castle Esplanade is tenanted. In addition to the students in residence it is proposed to have what may be called a little colony of "former pupils," and dwelling-houses will be occupied by mechanics, graduates and lawyers now in practice, and or two artists. The most important apartments are the dining-room on the ground-floor and common room on the flat above, the latter 40 ft. long and 20 ft. in width.

**SHEFFIELD SOCIETY OF ARCHITECTS AND SURVEYORS.**—A paper on the "Production and Distribution of Electric Light for Domestic Purposes" was read before the Sheffield Society



hits on the 10th inst., by Mr. Wm. Johnson, Manager and Secretary of the Sheffield Electric Light and Power Company, Limited. The evening took place at the offices of the company. It was held, in view of the electric light being taken into the residential districts, that electric lighting must be intimately associated with professional practice of the members of the city, and the paper was therefore devoted to subjects especially relating to the methods of production of electric energy, the distribution of electric energy through the supply mains, the insulation of interiors, the fitting-up and wiring residences, the importance of insulation, the measurement of electric energy, and the cost of electric lighting. Practical electrical demonstrations were given as the various subjects were treated. A vote of thanks to Mr. Johnson was moved by Mr. Innocent and seconded by Mr. P. Wilke. It was supported by Mr. E. M. (the President) and by Mr. Smith (Hemson Smith), and carried. The members were afterwards taken through the power station, where the fitting of the machinery and appliances was explained by Mr. Johnson.

**AND YORKSHIRE ARCHITECTURAL SOCIETY.**—A meeting of this society took place Monday evening in the Law Institute, Albion, Mr. J. H. Greaves presiding. Mr. W. H. A.R.I.B.A., read a paper on "Hospitals." He said that much information was available on the subject, but future scientific investigation would no doubt demand the relinquishing of opinions now held and the substitution of others. To gain a proper knowledge of the subject they must ascertain what failures there have been, and seek out the defects of the existing buildings. He strongly advised such personal investigation, as well as inquiry of doctors and nurses, as to good and bad points. The public should be interested in the external aspect, as well as the internal, should receive attention. They had to consider the health and happiness of the patients, the staff, and also an artistic exterior. Mr. H. A. R. I. B. A. referred to the two systems of artificial ventilation in use, air taken out by suction, and air forced into a room. He explained the ventilation of the hospital at Birmingham now being carried out by his plans. There the air, freed from dust and insect life, will be drawn to the ward, and extracted by means of a fan, and the ventilation of a similar character is in use at the Victorian Infirmary at Glasgow, and it works exceedingly well. In hospitals it is desirable that the air should not circulate downward to ward, and for this the system proposed. A vote of thanks was accorded to Mr. H. A. R. I. B. A.

**ARCHITECTURAL SOCIETY.**—On the 10th inst. the seventh ordinary meeting of the sixth session of this society was held at the Library, Union-court, under the presidency of H. W. Keefe. The chief business of the evening was the reading of a paper by Mr. W. E. of Croxeth, entitled "A Few Notes on the History of Architecture in the West of England." Remarks of Mr. Hill were illustrated with light views.

## ENGINEERING SOCIETIES.

**INSTITUTION OF CIVIL ENGINEERS.**—An ordinary meeting of this Institution on the 10th inst., Sir Robert Rawlinson, K.C.B., Vice-President, in the chair, the first paper read was "The Training of Rivers," by Mr. L. F. H. A. R. I. B. A., M.Inst.C.E. Training of rivers were considered successively under four divisions, namely:—(1) along non-tidal rivers; (2) the outlets of tideless rivers; (3) along tidal rivers; and (4) through tidal estuaries. A second paper was subsequently read by Mr. H. L. A. R. I. B. A., on "Estuaries."

**CIVIL AND MECHANICAL ENGINEERS' SOCIETY.**—At the ordinary meeting of the Civil and Mechanical Engineers' Society, held on the 12th inst., a paper was read by Mr. R. H. A. R. I. B. A., M.Inst.C.E., &c., on "Liquid in the Future." The author began by pointing to the use of hydro-carbons or liquid fuel, which were first introduced after the development of petroleum in America in 1863. Several patents were taken out in this country for the application of liquid fuel as far as 1863. The most successful general application of liquid fuel was made by Mr. H. A. R. I. B. A. in South Russia. Mr. Holden has since adopted liquid fuel on the Great Eastern Railway. The calorific value of petroleum was given, and divers authors and results cited which it appears that practically one ton of petroleum residue is equal to nearly two tons of

coal. The advantages in the use of petroleum were then referred to, and amongst these were economy of stoking on board ship and ease of working on locomotives. The results obtained on the Great Eastern Railway, and the account of a steamer using petroleum residue only on a long journey across the Pacific Ocean, were given in some detail. Reference was made to the present and future use of hydro-carbons as liquid fuel; the oil-engine was cited, and its applications to mining and other purposes. The advantages were pointed out which the oil-engine possesses over steam-engines, in the economy of space and first cost, and over gas-engines in its applicability in situations remote from gas-works. Some reference was also made to the increasing use of petroleum for domestic purposes, that is, in cooking-stoves in place of coal or gas in small households. The paper ended by a reference to the supply and cost of liquid fuel, pointing out that at present the supply to this country was entirely derived from two foreign countries, namely, the United States of America and Russia; under these circumstances the author was of opinion that it would not be wise to adopt petroleum as a fuel for the Royal Navy, and that although the supply of illuminating oil was adequate and the prices reasonable, the quantity available when considered as fuel was very small as compared with the consumption of coal. The conclusions of the author were that although the problem of the applicability of liquid fuel had been solved there remained the serious considerations of a large and constant supply at a sufficiently low cost to compete with coal.

## ARCHAEOLOGICAL SOCIETIES.

**SOCIETY OF ANTIQUARIES OF SCOTLAND.**—The usual monthly meeting of the Society of Antiquaries of Scotland was held on the 9th inst. Mr. Balfour Paul, Lyon King of Arms, in the chair. The Hon. John Abercromby exhibited and described a tanged dagger-blade of bronze found near Crawford Priory, in the parish of Culter, Fifeshire, and a plaster cast of a fragment of a sculptured stone of the early Celtic type, showing an incised and well-defined head of an eagle or bird of prey and a figure in relief of a half-moon shape with the horns recurved inwards, the original of which is preserved at Crawford Priory. In the second paper Mr. John Findlay, F.S.A.Scot., described a collection of worked flints, about 100 in number, which he had found in the desert at Gebel-el-Gheir and other localities near Luxor, Egypt, and now presented to the Museum. Dr. Munro referred to the evidence brought forward for the existence of a stone age in Egypt as being continually strengthened by such contributions as those of Mr. Findlay. In the third paper Dr. D. Christison, secretary, dealt with Scottish place-names in relation to forts. Mr. G. F. Black read a notice of a charm-stone exhibited by Mr. James Campbell, of Craignish.

## SURVEYORSHIPS.

**DISTRICT SURVEYORSHIP TO THE BLACKBURN HUNDRED.**—A meeting of the Main Roads and Bridges Committee of the Lancashire County Council was held on Wednesday last, Mr. W. B. Hulton in the chair, when the question of the appointment of Surveyor to the Blackburn Hundred was considered. There were 185 applicants for the post, the following six being selected to appear before the Committee:—A. E. Brooks, District Surveyor, Herts County Council; W. J. Bryning, Assistant Borough Engineer, Walsall; J. W. B. Carruthers, Assistant Chief Surveyor of Roads, Liverpool Corporation; H. Frost, Surveyor, Wolverhampton; R. C. Ivy, Town Surveyor, Ormskirk. After a lengthy hearing, the matter being voted upon, it was decided to appoint Mr. W. J. Bryning.

**ABERDEEN SCHOOL BOARD.**—At a meeting of the Aberdeen School Board last week the question was raised of the contract for the ironwork of Broomhill School, for which Messrs. Blaikie Bros. had submitted the lowest tender (as advertised in our columns at the time) but were not accepted. A member of the Board, Mr. James Smith, explained that Messrs. Blaikie's tender had been refused "on account of some inefficient work on a former contract," but that he had ascertained that the inefficiency (which consisted in the school railings being insufficiently fixed in the plinth) was the fault of the masons, who had not cut the holes deep enough, and not of the iron-workers, who did their best under conditions not of their making. It seems to be admitted that the Board made a mistake in refusing Messrs. Blaikie Bros.' tender in the case alluded to.

## Illustrations.

### THE GREY FRIARS AND NEWGATE.

EVERYONE knows that the present Bluecoat School occupies the site of the ancient monastery of the Grey Friars or Franciscans, and that "Newgate" was at one time a genuine gate. Few people, however, have any idea as to what the old gate and the convent were like before their destruction.

Of the Grey Friars' building a small portion, consisting of the south walk of the cloister, still exists, though in so mutilated and modernised a condition as to give little idea of its former beauty. Of the old City gate and prison of Newgate, not one vestige exists.

As the gate was the earlier (as to its foundation) of the two buildings we will take it first. All kinds of suggestions have been offered in explanation of the name "Newgate," but probably the most obvious one is correct, *i.e.*, it was built at a later date than some of the other City gates. It was several times rebuilt, but that which existed down to the time of the Fire of London was erected by the celebrated Richard Whittington, or by his executors with money left by him for that purpose in 1423. Whittington's executors also erected a chapel for the prisoners. Their work was so well carried out that complaints were made that the building was more like a palace than a prison! The gate was damaged by the fire of 1666, patched up, and partly rebuilt, but it is shown in old drawings.

The street which ran from this gate eastward was anything but a pleasant neighbourhood; one part of it was called "Blow-bladder-street," and another "Stinking-lane"; here was, in fact, the City's shambles, and along the middle of the street were ranged the butchers' stalls. In this unsavoury locality the Franciscans, or "Grey Friars," settled, and with the assistance of some wealthy citizens, erected a church and monastery about 1225; but the church was almost entirely rebuilt in the reign of Edward I. Margaret, second queen of Edward I., gave 2,000 marks towards the choir, which was begun in 1306. The nave was subscribed for by many members of the nobility and the citizens. Gilbert de Clare gave twenty great beams for the roof, cut in his forest at Tunbridge. John Britain, Earl of Richmond, Baron Lisle, Lady Burgh, &c., &c., were liberal subscribers. The church was twenty-one years building, and was completed in 1327. The stalls were given by Margaret Seagrave, Countess of Norfolk, in 1380, and Richard Whittington built the library in 1429, which was 129 ft. long and 31 ft. wide, "all ceiled with wainscot, having twenty-eight desks and eight double settles."

The church, which was the largest in London, with the exception of St. Paul's, was 300 ft. long, 80 ft. wide, and 64 ft. high to the apex of the roof. As shown in old views, plans, &c., it consisted simply of a vast nave and aisles, and a choir and with aisles of the same width, height, and length as the nave; a ground plan (which is probably copied from an ancient one) shows that between the nave and choir was a very narrow bay, the lateral columns being so near together as to give the idea of some support being required. In Vischer's view of London a *fiche* is shown over this point, and I should think it was of stone, and constructed something after the manner of that of the Grey Friars Church at Lynn. The clearstory was continuous from end to end, and there was a large staircase, turret, or tower half way down on the south side. The west end appears to have had screen walls concealing the aisles, like Newstead Abbey, Salisbury Cathedral, St. Saviour's, Southwark, &c. This has led Aggas into the mistake of representing the aisles as being two stories high. At the east end were tall pinnacles.

The monastic buildings appear to have been of various dates, but were chiefly Early Decorated. It has been stated that the refectory stood upon the site of the present hall, but this cannot have been the case, as here was the "outer court" of the monastery. No doubt the refectory was on the site of the old hall in the west cloister, and the building on the site of the present hall was the "guest hall," which arrangement would be in accordance with all the plans I know of Franciscan monasteries. Where was Whittington's library? I am inclined to think it was the building shown in old views over the north

• Theodore Hook, in a pasquinade against Queen Charlotte, refers to this street as the abode of some of the "ladies" who attended the Queen's reception at Brandenburg House; but he calls it "Blow-bladder-street."  
—Ed.



cloister, as this building is evidently a later addition, and the windows of the old dormitory are seen beneath it.

The dormitory appears to have been over the north and east cloisters, and the infirmary, with its cloister and chapel, erected by Peter de Helyland, must have stood to the north-east.

At the suppression the church and building were spared, and, later on, the former was made into a parish church; the parishes of St. Nicholas-Shambles and St. Ewan being united with it, and the latter became the "Blue-coat" School, or Christ's Hospital.

The magnificent monuments, however, were all taken down by an alderman of London, named Sir Martin Bowes, who sold "nine tombs of alabaster, coped with iron, and seven score grave-stones of marble for 50l." in the reign of Edward VI. Four of these "tombs of alabaster" covered the remains of Queens Margaret, Queen of Edward I., Isabel, wife of Edward II., and with her the heart of that unhappy monarch, Joan of the Tower, Queen of Scotland, wife of Edward Bruce, and Elizabeth FitzWarren, Queen of the Isle of Man. The barefaced impudence of this act of destruction is almost incredible, as the families of the Royal and noble people to whom these monuments were erected were still living. When, however, we come to consider that the grave of Whittington himself was rifled, and his lead coffin sold by the parson of the church which he had himself rebuilt, nothing will astonish us that took place under the rule of "Protector" Somerset.

The Fire of London entirely destroyed the church of the Grey Friars, but considerable remains of the monastic buildings existed when Shaw erected the new hall, cloisters, &c. All that now remains is the inner wall of the south cloister-walk, but the windows are deprived of their tracery, and their mouldings have been cut away, and in a very few years even this will disappear. H. W. B.

#### ADDITIONS TO TOTLEY HALL.

TOTLEY HALL, the residence of Mr. W. A. Milner, J.P., is situated on the border line between Yorkshire and Derbyshire, about six miles from Sheffield. The house is a good type of domestic Derbyshire work of the latter part of the sixteenth century. The additions, consisting of the billiard-room and an extension of the dining-room, have been faithfully carried out on the lines of the old work, and with a desire to preserve one of the few remaining quaint bits of historic architecture of the neighbourhood. The architect is Mr. J. D. Webster.

#### THREE CHIMNEY-PIECES.

THE first of these is in the drawing-room of the house that William Burges built for himself at Holland Park. It represents the garden of the "Rosaunt of the Rose"; above this is a statue of Amor, with a silver arrow. The whole is painted in bright colours, heightened with gold.

The second drawing is from one of the supporting figures of the dining-room chimney-piece in Dorchester House, Park Lane. After the Wellington Monument this is probably the most complete work by Alfred Stevens.

The illustrations are from pencil drawings by Mr. W. R. Lethaby.

#### PULPIT, ST. PETER'S CHURCH, BUSHEY HEATH.

THE pulpit from which our illustration is taken has been erected in the parish church of Bushey Heath, by the friends and neighbours of Mr. Simpson Noakes, as a memorial. The pulpit, which is of stone and marble, is from the designs of Mr. James Neale, of London. Messrs. Norris & Sons, of Sunningdale, were the general contractors. The carving was executed by Mr. Smith, of Battersea, from models at Beverley and St. Albans Abbey.

#### ST. ANDREW'S FREE CHURCH, AYR.

THIS new church, which has just been opened, occupies an excellent site in Park-circus, Ayr, and the spire, which is over 150 ft. high, forms a conspicuous feature in the district. The church is seated for 760 persons, and is planned internally in nave and side aisles, with galleries at sides and end. The galleries are carried on corbels projecting from the stone columns which divide the interior into three bays on each side, and are treated in oriel form between each column, thus allowing the piers to be carried up unbroken from the floor to the moulded stone arches over,

and avoiding the usual stiff lines of a gallery front. The ceiling is very lofty, the timber construction all shown. Behind the pulpit the organ-chamber is placed, with moulded stone arch rising from clustered columns, and a richly-finished wood screen of open tracery is carried across the opening from each side of the pulpit. A simple temporary scheme of decoration has meantime been carried out, with soft lemon-yellow tones and plain coloured bands on the upper walls, a richer and darker shade on lower walls, with simple ornamental bands, the seating and wall linings stained to a soft green tint, with gallery-front, pulpit, and screens in grey oak of lighter tone. The windows, in cathedral glass of mixed tints, have simple coloured borders enriched with roundels at intervals, and the gas-lighting is by cornice and brackets of wood, iron, and copper. The heating, ventilation, and acoustics are stated to be very satisfactory.

The work is from the design of Mr. John B. Wilson, of Glasgow, whose plan was selected by Mr. H. J. Blanc, assessor in the limited competition. The work has been carried out principally by local contractors, at a total cost of 5,220l., being within the estimated cost named in the competition.\*

### Books.

*The Architecture of the Churches of Denmark.* By Major ALFRED HEALES, F.S.A. London: Kegan Paul, Trench, Trubner & Co.

MAJOR HEALES complains with some justice that the merits of the larger churches of Denmark, and the type and individuality of the smaller churches, have not received the attention they merit, and that visitors to Denmark seldom take the trouble to explore them. Still, the notice of them in Fergusson, and the illustrations which Fergusson himself derives from Marryat's book, show that they have not been so entirely neglected as the author of the present concise and interesting little treatise would imply.

The larger churches of the country do not differ very materially in style from the north German churches of the Romanesque period, except in some minor details arising from local tastes, and the influence of local materials. We have the same flat strips of plaster, connected at the top by lines of rude arcading, which are familiar in the ancient churches of North Germany, and in very early Norman buildings in England. The west front of Viborg Cathedral might well have come from Germany. The special interest of the building lies in its remarkable nave arcade, consisting of totally un-moulded semi-circular arches resting on piers which are only square masses of masonry of the same section as the arch, and only divided from it by a projecting impost moulding which is more like a string-course than a capital in its manner of application. The building belongs to the twelfth century. Ribe, too, seems familiar enough in its general aspect and details, except in the exceedingly plain square finish of the tower, which looks as if chopped off short. It is in the smaller parish churches that we find the most marked speciality of type. This special character arises no doubt to some extent from the difficulty, especially for small churches in country districts, of doing anything but the simplest work with such a material as granite, which was the staple building material until the introduction of brick in the fifteenth century. Thus the small church of Bräkum, one of the illustrations, presents scarcely anything but a plain wall with small round-headed windows, high up from the ground, pierced in it, the only decorative feature being a series of intersecting arches under the eaves. The western tower shows one of those rudimentary spires, of square plan and comparatively low pitch, which are also so common in early North German architecture. The most curious and interesting buildings are the churches with round or octagon naves in Bornholm, with a rectangular chancel projecting from one side, and the centre space upheld by columns—in the case of Bjernede Church, four massive cylindrical columns, forming four corners of a square—in the centre of the circular nave. One of the most curious of all the ground plans is that at Kallundborg; a square, with four columns in the centre, and an arm like a chancel, ending in an octagonal apse, projecting from each of the four sides of the square; the whole forming a completely-developed equal-armed cross. The

round churches of Nylasker and Nykirke (whose latter name we presume is simply "New-church," of which views are given, are very primitive like home-like edifices, with no windows to speak of, only little slits in the wall made at random, and high conical roofs which however are not, as the author says, original.

Considering that the Danes were conquerors of Normandy, it is not surprising to find among these Danish churches characteristics which are like the precursors of the Norman cushion capital, and mouldings which have strong Early Norman physiognomy. Some of the fonts, of which a good many are engraved, are curious and interesting design.

The plans, sections, &c., are all given with any scale of feet, which is a serious deficiency from an architect's point of view; indeed, except in the fact that sections of mouldings (also not to scale) are pretty liberally given, the book is not one for architectural students; but is an interesting and well-written little volume, an author who takes great interest in his subject, and it may be useful in turning more attention to a rather neglected corner of European architecture.

*Skeleton Construction in Buildings.* By WILLIAM H. BIRKMIER. New York: John Wiley & Sons. London: Gay & Bird. 1893.

THE employment of considerable quantities of iron and steel for supporting large buildings, a comparatively recent method of construction, although it is one that is now being much adopted in the National Liberal Club at Whitehall, for example, not only are steel columns and girders very largely used, but the floors are of steel, and corrugated floor-plates similar to those used in bridge-work being adopted throughout. And in the construction of theatres, this method of particular value, and has been employed with much success in many of the recent buildings of this kind. To support the balconies of buildings by columns which prevent a view of the stage being obtained, must be regarded as faulty construction, with properly designed girder-work, obstructions are rendered wholly unnecessary.

The design of iron and steelwork requires such purposes is in nearly all cases of a simple character, and the object of Mr. Birkmire's book is to describe and illustrate the most modern methods of such construction. Naturally, the book chiefly refers to American practice, where the system has been very largely employed, with result, no doubt, that many of the buildings carried to great heights which before would have been impossible without enormously increasing the thickness of the lower portion of the walls; consequently, losing much of the more valuable space; but with the correlative result that the whole thing is an architectural sham, monumental architecture in the true sense of the word is at an end. Whether this method of building will ever be tolerated or practised, English architects it is not easy to prophesy. London at all events the legal limitations of height will take away its chief or only advantage. If we ever do come to that, however, the book implicated will find useful information in Birkmire's book; but we counsel them in case to be content with the honest steel building and not make the matter worse by erecting sham masonry building outside it.

*Patents for Inventions: Abridgments of Specifications.* Class 20, Buildings and Structures. Period A.D. 1877-1883. London: The Institution of Civil Engineers.

THIS is one of a series of abridgments of specifications which is being issued by the Institution of Civil Engineers in book form, with the laudable object of facilitating the inquiries of inventors and the existing patents in regard to the classes of objects in which they are interesting to themselves. We have here the main facts of many former patents, condensed into paragraphs with cuts where necessary for explanation. It is an alphabetical list of classes of subjects, another of names of patentees. Unfortunately the value of such a publication is very much discounted by the fact that its latest synopsis is nearer than ten years ago; and when an intending to take out a patent wants to know he has been anticipated, it is to the patents of the previous ten years or so that he looks closely, because these are more likely to be present force and to offer a bar to his own; but just these that he cannot find here. If the Institution intends to bring up the publication to a new office of the date of publication, and keep-

\* We regret that, owing to the absence of the architect from home, his plan of the church arrived too late for publication.





Proposed Additions to  
Totley Hall  
for W. A. Misner Esq.

M<sup>r</sup> J. D. Webster F.R.I.B.A. Architect



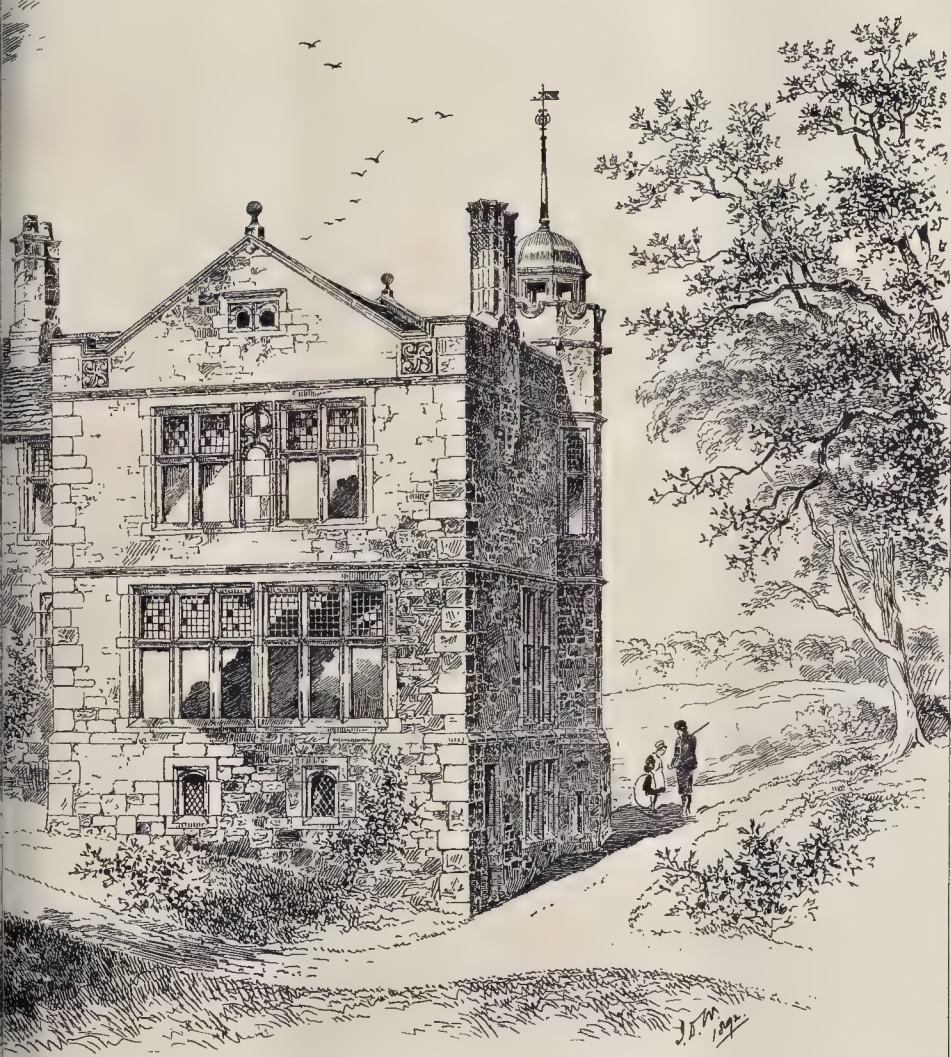


PHOTO BY SHAW & CO. 4 & 6 EAST HARDING STREET FETTER LANE E.C.







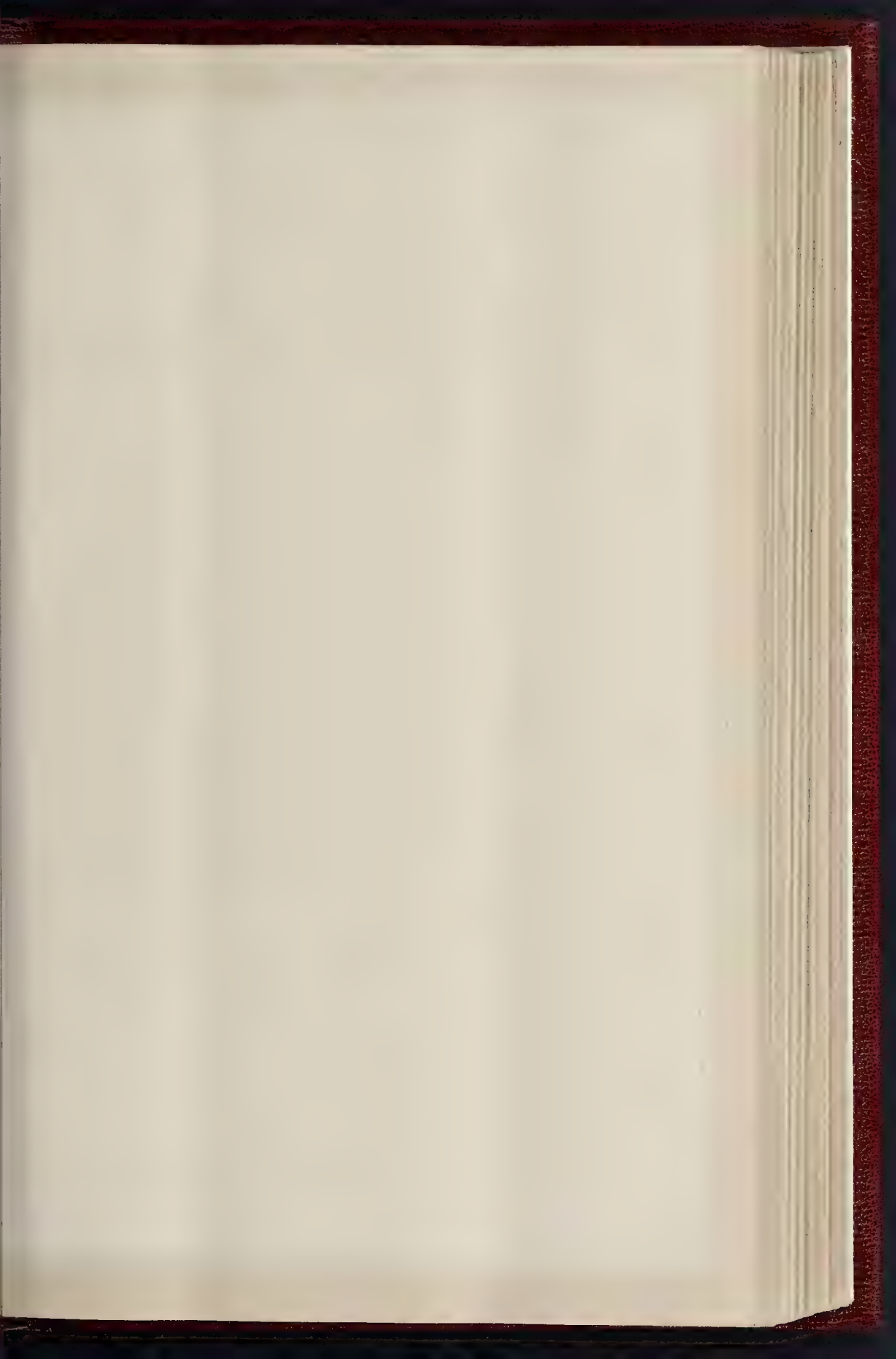


THE BUILDER APRIL 21 1894



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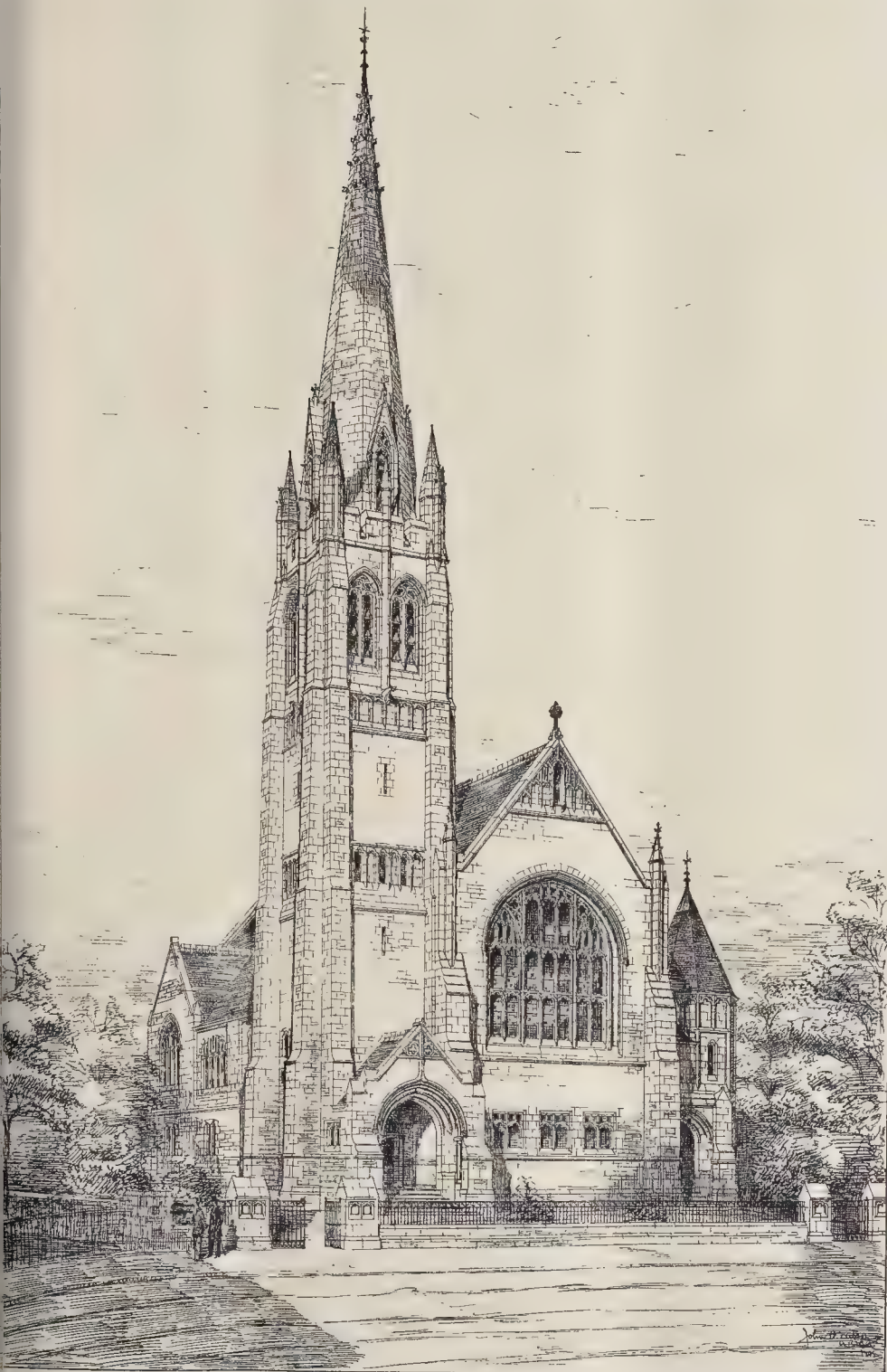






Nokes Memorial Pulpit, St. Peter's Church Bushey Heath. James Neale Esq. Architect. 10, Bloomsbury Square.

PL. & LITHO. SPRAGUE & CO. 48, EAST HINDIC STREET, FETTER LANE.



\* Saint · Andrew's · Free · Church \* AYR \* John B. Wilson, A.R.B.A. Architect, Glasgow.

PHOTO LITHO. SHARPLES & CO. 48, EAST HARDING STREET, LONDON, E.C.





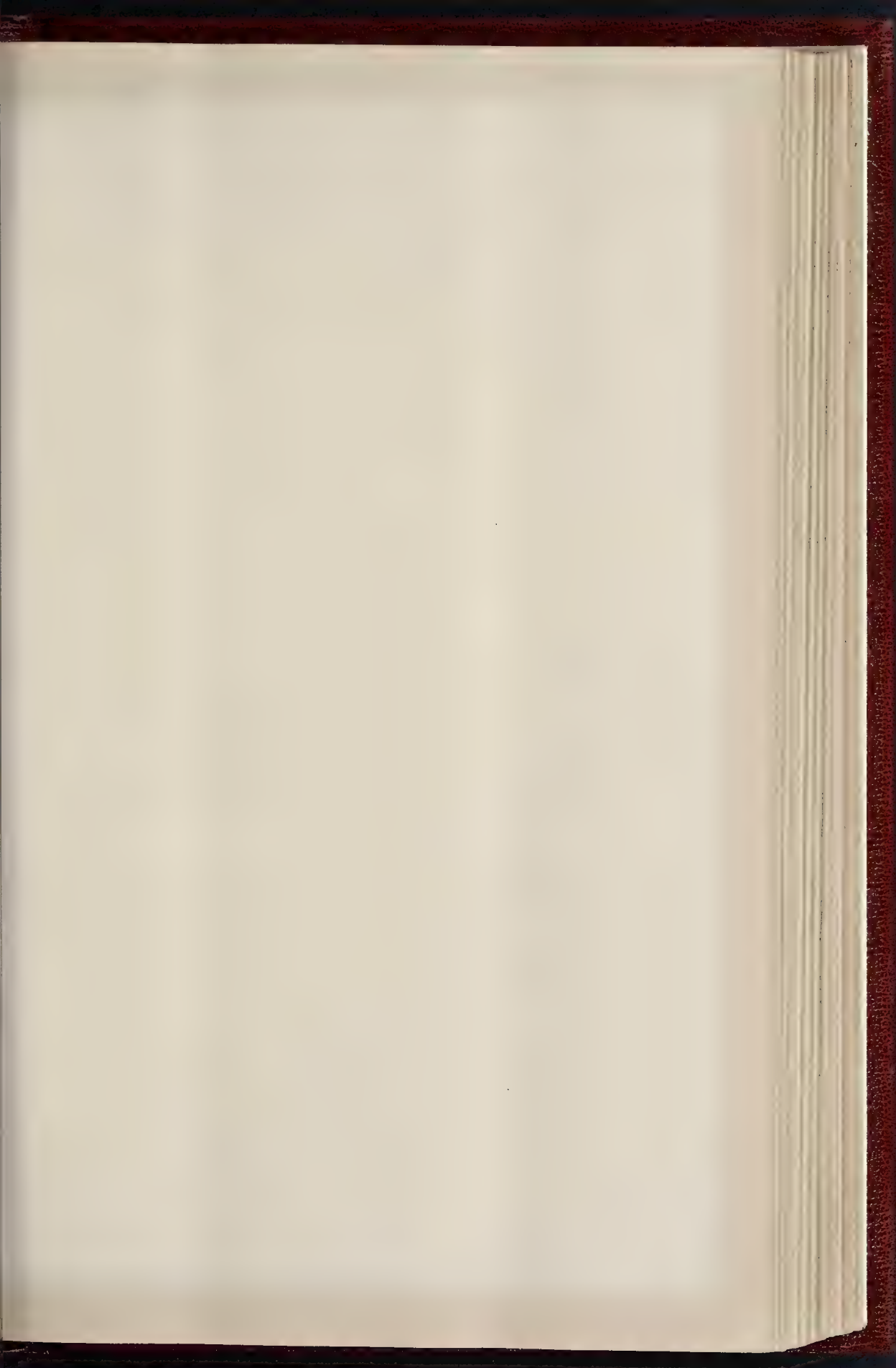


PHOTO SPRAGUE & CO. 42 EAST HARDING STREET JEFFERSON LANE E.C.

FIGURE FROM CHIMNEY-PIECE AT DORCHESTER HOUSE, BY ALFRED STEVENS.  
DRAWN BY MR W. R. LETHABY









THE BUILDER, APRIL 21 1894

CRIPPLE GATE.  
City Ditch

ALDERSGATE  
Aldersgate Church

GUILD-HALL. ST LAWRENCE  
JEWRY

ROYAL TRINITY  
PRIORY  
ALDINGATE.

GREY-FRIARS MONASTERY.

MINISTERS.  
LEADER-HALL.

GREY-FRIARS  
CHURCH.

ST MICHAEL'S  
CORN-HILL

ST MARTIN  
LE GRAND

ST NICHOLAS SPERMITES.

BUTCHERS-  
STALLS

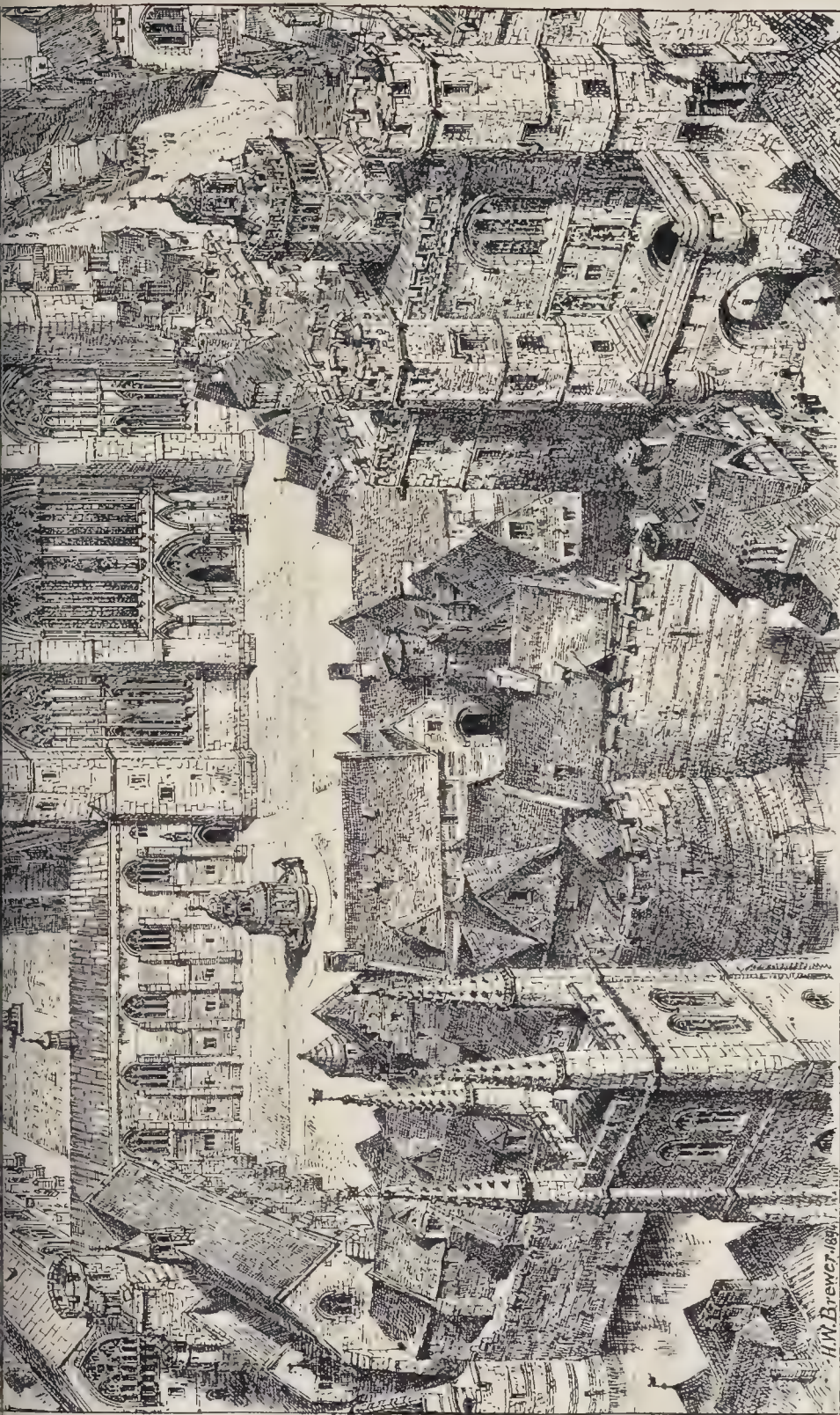
BOW CHURCH.  
Creek Creek

ST LAWRENCE  
POURNIENY.

THE BISHOP'S GARDEN.







LIBRARY, GUEST-HALL.

H.M. Brewer, 1891.

S' SEEDUCHRES.

REFECORY, CLOISTER

CONDUIT.

OUTER-COURT.

OLD GREYRIARS AND NEWGATE — DRAWN BY MR. H. W. BROWN

NEWGATE.

ST EWANS CHURCH.

THE CITY OF LONDON, AS IT WAS, 1891. BY H. W. BROWN. LONDON: PUBLISHED BY THE AUTHOR, 1891.





that point, it will be really useful. But a list ten years old is of little use except to show the good intentions of the Department.

**Studies from the Museums: Wood-carvings from the South Kensington Museum.** Edited by ELEANOR ROWE. London: R. Sutton & Co. Its portfolio, which appears to be part of a series under the heading formed by the first sentence of the above title, contains eighteen large plates of important objects of carved wood in the South Kensington Museum, reproduced by photography, and thus representing exactly the character and modelling of the originals. The plates are very well selected, as adapted to inspire the modern worker in wood with the use of breadth and power of style. In some sections outline sections are given of the principal buildings; it would have been better to have done this in all cases.

**Notes on Wood-carving.** By ELEANOR ROWE. Fourth Edition. London: Sutton & Co. This is a revised and enlarged edition of the small little handbook for beginners, by Miss Rowe, the manageress of the school of art wood-carving in the Central Technical School in Exhibition-road. We have before referred to the work in its former editions.

NEW DIRECTORIES.

The edition of the "Directory of Contractors and Public Works Annual," edited and compiled by Mr. William Biggar (Vale, Chiffertel, & Co., Ltd., 31-37, Cursitor-street, E.C.), which has been sent to us, is the third which has been issued, and we see no reason why it should not be followed by others, since it is a useful work, well arranged. The book contains lists of railway, dock, pier, dredging, waterworks, gasworks, road and drainage, tramway and builders' contractors, all alphabetically arranged, as well as lists of railway and other engineers, county, city and borough, local board, metropolitan, and district surveyors. Useful features of the directory are the enumeration of bills in Parliament of a municipal character, applications for provisional orders, public works under construction, and a summary of legal cases. So far as we have been able to test it, the directory seems to be thoroughly reliable, and no doubt it is becoming an indispensable work to those interested in all kinds of constructive work. It is not quite up to date in some instances, and an otherwise well-got-up publication has been to some extent spoiled by the introduction of advertisements in the body of the directory; but on the whole it is a very useful work, which has only to be known to be used.—We have received the "Electrical Trades' Directory" for 1894 (G. Tucker, *The Electrician*, Salisbury-court, E.C.), which is the fiftieth edition of a useful and comprehensive work. The Directory consists of three divisions, the Handbook, the Directorial, and the Biographical, and so far as we have been able to test the work, it seems to be quite up to date. Space is devoted, amongst other matters, to a summary of electrical events for 1893; obituary notices; information relating to patents, designs, and trade marks; digest of the law of electric lighting; Board of Trade lighting regulations; London County Council regulations as to theatre lighting; rules and regulations for the prevention of fire risks arising from electric lighting (British and Foreign); installation regulations of the Metropolitan Electric Supply Companies; electric lighting and electric traction notices for 1894; internal electric lighting stations of the United Kingdom; electric railways and tramways in the United Kingdom; and colonial and foreign reports upon electrical machinery and apparatus. The Directory also contains sketches of the lives of 261 men in the electrical world, and in thirty instances a portrait accompanies the sketch, that of Mr. Alexander Siemens being from an engraved steel plate. The price of the Directory is 7s. 6d.—*Dod's Parliamentary Companion for 1894* (Whitaker & Co., White Hart-street, E.C.), an issue of the new edition of which has been sent to us, is now in its sixty-ninth edition and its sixty-second year. Its contents include lists of members of the Houses of Lords and Commons, a list of the constituencies, lists of officers of both houses, and most useful and concise biographical notices of members. In addition, the issue contains a great deal of interesting matter, very conveniently arranged, in explanation of Parliamentary terms and proceedings. In the issue before us a list of the Acts of Parliament passed during the session 1893-4 has been included.

TRADE CATALOGUES.

MESSRS. ELLIS, PARTRIDGE & Co. send us their handsome volume of illustrations of moulded and ornamental bricks made by them, the designs being, we are informed, the work of an eminent Midland architect. The hand of the architect is more especially shown in the profiling of the mouldings, which are mostly very good and are very varied. We do not admire all the ornamental details equally (for moulded panels, ornamental bands, &c.); some of them are too realistic in style; among the good ones we may draw attention to Nos. 360, 381, 396, 400, 406. There is a better architectural style about the book generally than about many trade catalogues of the kind.—We have received a large catalogue from Messrs. CARR BROS., of Bradford, of shop-fittings—glass cases of all kinds, lamp-tables, mantle and costume stands, &c. The illustrations of shop-fronts are, as might be expected, no better than shop "architecture" usually is. We should have thought more of the issuers of the catalogue if, in addition to calling attention to their no doubt well-made and convenient goods for practical purposes, they had gone to an architect to get them two or three tolerable drawings for fronts, instead of the unhappy designs published here. Perhaps they will do so when the time comes for another issue of their catalogue.—The Staffordshire Bolt, Nut, and Fencing Company send us their illustrated catalogue of very workmanlike-looking agricultural iron-work of every kind, in the way of fencing, gates, plant-guards, &c.—Messrs. Leverstock & Acorn, Red Brick Company, send us a catalogue chiefly of moulded bricks for various positions, with a few very simple forms of brick ornamentation.

Correspondence.

To the Editor of THE BUILDER.

AMERICAN SURETY COMPANY BUILDING, NEW YORK.

SIR,—In reference to the above building, illustrated in your last issue, it would be interesting to architects to know how light is obtained to the premises from the ground line to the top of adjoining buildings in each street. On the plan given, windows are shown on the four sides of tower, which must evidently, however, be only above the roofs of the adjoining property. Below this, for about six or seven stories, light can only be obtained on two sides—consequently, half the offices would be in total darkness. Again, would it not be possible for the adjoining owners to erect buildings of similar height against this tower, and so block out the windows on two sides all the way up? It would be interesting also to know if it is proposed for this building to be constructed with an iron frame-work, the external walls being casings only; this is not stated in the description; from the plan given, it would seem as though they were walls built in the ordinary way, as in this country. I should imagine that in these tower-like buildings it is almost a necessity to have streets on the four sides if they are to be well lighted. Liverpool, April 18, 1894. JAMES N. CROFTS.

HOURS OF WORK.

SIR,—Having noticed in different organs of the Press the fact that a deputation has attended before the Metropolitan Asylums Board and presented a memorial asking the Board not to insert in their contracts any clause restricting the hours the men employed by the contractor to the Board should be allowed to work, and that the deputation has met with success, I venture to ask whether the time has not arrived to use every effort to open the eyes of the general public to the oppression which the Society of Amalgamated Carpenters and Joiners have endeavoured to place on the non-society men, and feel sure from the tenor of the remarks heretofore made in your valuable journal upon this subject, you will assist the non-society men in their efforts to prevent their being forced into the Society net. If a building firm adopts the eight hours their machinery must be idle by that reduction of time, causing a loss of at least 50 per cent. How ridiculous is the statement of the Society that men can do as much work in eight hours as in ten. Will this statement be supported by any reasonable man? Even if such were the case, I say it would be proving that the British workman had, for all past time, been deliberately wronging his employer of the work of two hours per day. The Society say that by adopting the eight hours' system more men would be employed. Now they

\* The plan, as was stated, represents the general arrangement of the upper stories, which are divided off into small offices. The others, we gather, are not so divided. We will endeavour, however, to get some further information as to the arrangement of the lower stories.—Ed.

have tried this eight hours' system for some two years, and I ask is it not the fact that there are more men out of employ this year, according to the Society's own report, than there were even last year. The natural result is an increase of rates. I am glad to see the Metropolitan Asylums Board have supported the assertion by the men of their right to work such reasonable hours as their health and strength will permit, so long as they, by so doing, do not injure their fellow workmen. The object of the Society, of course, is to compel every man, whether he be willing to do so or not, to comply with their unreasonable rule in this respect, and I am glad to see they will not be allowed to do this, and I think all who are acquainted with the subject will agree with me when I say that it is my opinion a ten-hours' day is not too long in the building trade, and I trust non-Society men will not allow their views in this respect to be altered by the utterances of any number of paid agitators. "NON-SOCIETY."

OWNERSHIP OF ARCHITECTS' DRAWINGS.

SIR,—I shall be much obliged if some correspondent will kindly refer me to a decision in the *Builder*, between 1880 and the present time, respecting the above, in the case where a building has been erected and the architect's charges have been paid. Also if the question of ownership has been affected by the recent "Copyright Act," and if so, I presume the Act is not retrospective. AN ARCHITECT. P.S.—If the ownership of drawings is affected by the Copyright Act, is it adversely or in favour of the architect?—A. A.

BOILER EXPLOSIONS.

SIR,—It is somewhat disappointing that those who have been called in to reinstate the damage after boiler explosions have not given us the benefit of their experience, as it would have been far more useful than any theory, however good. Your able correspondent, Mr. W. P. Buchan, in the last paragraph of his letter (page 256 ante), mentions one reason—viz., both supply and expansion pipes being frozen at the same time, which everyone will agree with; also the case of the supply, flow, and return pipes being likewise frozen. No doubt, in either of the above cases, or in any condition in which the boiler becomes sealed, a safety-valve kept in proper order would prevent an explosion; but an important question arises in the case of the cold supply failing or freezing for a sufficient length of time to allow of the water being completely evaporated from the boiler, the boiler becoming red hot and the cold water running into it, while there is no doubt that the kitchen would not be the safest place in the house at the time. Does a safety-valve prevent an explosion in this case? If some of your readers who have seen the arrangements of pipes and boiler where an explosion has occurred, would give a description of the facts, they would be conferring a benefit on all interested, and help to save life as well. My own opinion (the result of twenty years' experience) is that with the cylinder system there is a minimum of danger. A safety-valve should be fixed in all cases as near the boiler as possible; or better still, with a direct pipe from the boiler independent of the flow or return, and larger in diameter, as in numbers of cases it is found that a flow and return pipes so much furled up that, with a little more use, they would have been entirely closed, and an explosion must have occurred; whereas with a larger pipe, when the flow and return were closed, the larger pipe, taking longer to fur, would still be open to the safety-valve. CHAS. THOMERSON, R.P.

April 7, 1894.

IS A CONCRETE FLOOR SOUND-PROOF?

SIR,—I am connected with a block of flats which have been recently erected, the floors having been constructed with 6 by 2 rolled iron joists, filled in solid with concrete. On this concrete, 4 in. by 2 in. wooden joists were laid and 1½ in. floor above, the ceilings being laid direct on to the soffit of the concrete. Ordinary sounds can be distinctly heard through the floors. I should be glad if any of your numerous readers can suggest a cure. I have been advised to pack the space between the top of concrete and floor boards with sawdust. CIVITAS.

THE SANITARY INSTITUTE EXAMINATIONS.—At an examination for inspectors of nuisances, held in London on April 6 and 7, 126 candidates presented themselves. Questions were set to be answered in writing on the 6th, and the candidates were examined *visu voce* on the 7th. Sixty-one candidates were certified to be competent, as regards their sanitary knowledge, to discharge the duties of Inspector of Nuisances.



## The Student's Column.

### THE STRUCTURE AND PHYSICAL PROPERTIES OF BUILDING STONES.—XVI.

#### 3. THE TISBURY DISTRICT.

**T**HE quarries in this district are situated near Tisbury, in Wiltshire, also between that place and Wardour Castle, at Teffont Evas, and in the Chilmark "ravine." The stone from the last-mentioned locality is probably better known in the market than that from the others, having supplied material for the restoration of Westminster Abbey and many other notable buildings; our observations will therefore be largely confined to it.

The following geological sketch map (fig. 23)

that adopted in any district hitherto described. The stone is cut from the parent rock by means of compressed air drills, supplied by a compressor at the underground entrance. The rock drill cuts a deep horizontal channel below the stone to be quarried—i.e., along the bedding-plane between the "soft" and "hard pinney"—after which wedges are driven home in the top of the former, when the block breaks off at the back and falls loose on the bed beneath. It is then removed, placed on a truck and drawn to the quarry's mouth by the engine before referred to—on the whole an economic means of working, and far in advance of methods usually adopted under similar circumstances. The building stone beds in the locality are never blasted.

On the other side of Chilmark ravine—the east side—another stone mine is situated, but as the material obtained therefrom is essentially the same

"Best White" Bed.—The micro-structure of this bed is very similar to that of the Basebed Portland described and illustrated in the last article of this series, and is an excellent indication, were other evidence wanting, of the Portlandian age of the beds under consideration. It may be distinguished from the Portland stone referred to, by the presence of occasional well-formed oolitic granules distributed amongst the darker grains, by its more open character, absence of a matrix of any kind, and a greater proportion of nuclear quartz grains. This is evidently a fairly good material and fine-grained.

"Bottom White" Bed.—This also possesses true Portlandian oolitic granules, of the usual hazy description, though somewhat decomposed in places. It can be easily distinguished from the last-mentioned bed by its greater abundance of matrix, and consequently less open character, by its oolitic granules, which are not quite so hard, and especially by the very large proportion of quartz grains, not usually occurring as nuclei in the "Best White" bed, but as free, angular fragments. Both this and the "Best White" bed are called "white" by courtesy only; they are merely lighter in tint than some other building stones in the vicinity. We should describe the material as a fine-grained, light yellowish-brown, sandy oolite.

"Trough" Bed.—Indistinct, small, oolitic granules and shell fragments (both large and small), with a large number of quartz sand grains scattered throughout a crystalline calcitic matrix. The stone owes its hardness to the high state of crystallisation of the matrix, and also to a certain extent to the abundance of quartz grains. The silica does not assist in its preservation in the slightest degree, though it is a durable material.

"Green" bed.—A fine-grained, sandy oolite. The oolitic granules are very minute, and are greatly affected by what we have called secondary alteration; the quartz grains, which form about one-half of the stone, are free and mostly angular. The whole are bound together by a finely-grained matrix of carbonate of lime. The greenish tint is imparted by the abundance of particles having that colour, probably glauconite.

"Soft" or "Top Pinney" bed.—A very fine-grained, sandy oolite. Quartz sand grains are not present in such great quantity as in the "green" bed; they are mostly sub-angular and free. The calcitic matrix contains a little infilling silica. The minute oolitic granules are slightly more distinct than in the last-mentioned bed, and comminuted shell fragments are not rare.

"Hard Pinney" bed.—This, which is perhaps the most important building stone in the district, is also an exceedingly fine-grained, sandy oolite. Its structure is illustrated by the following diagram (fig. 24). It differs primarily from the "soft



FIG. 23.—Geological Sketch-map of Tisbury District.

a = Chalk. b = Upper Greensand. c = Gault. d = Lower Greensand. e = Purbeck beds. f = Portland beds. g = Kimmeridge Clay. x = Alluvium.

shows the sites of principal quarries in the area, several of which we have visited. The workings to the south and south-west of Tisbury, and near the railway station, produce stone chiefly known as "Garden," "Wardour," "Chantry," "Wockley," &c.

Walking from Tisbury, over Lady Down, we descend into the picturesque valley known as Chilmark ravine, where the Purbeckian is cut through by denudation, revealing the Portland Stone formation. On the west side is an open quarry exhibiting stone chiefly of the "Trough" bed, presently to be described. Near by is a large underground working, having a wide vertical shaft up which the stone is drawn by an overhead gantry. We noticed four headings underground, and a typical section gave the following:—

#### Chilmark Quarry.

	Thickness. ft. in.
"Green" bed .....	1 2
"Soft Pinney" or "Top Pinney" bed ..	3 0
"Hard Pinney" .....	4 0
Total .....	8 2

The "green" bed is not always exposed, and does not seem to be very actively exploited. The bottom bed—the "hard pinney" is evidently a good stone; we prefer it to the "soft pinney," though it is more trouble to work up.

The method of quarrying here is different to

as in the last quarry described no further mention of it is necessary.

A little to the north, but still on the east side of the valley an openwork exists, called Teffont quarry. This must not be confounded with that near Teffont Evas church, which is dug in very different stone. At the time of our visit the Teffont quarry was about to be converted into a mine. The workable beds were as follow:—

#### Teffont Quarry, Chilmark Valley.

	Thickness. ft. in.
"Brown" bed .....	2 4
"Best White" bed .....	2 0
"Roach" (not much used) .....	1 6
"Bottom White" bed .....	5 0
Total to 10 .....	

Other quarries are situated at Ridge, near Chilmark, on Lady Down, and there are some old workings at Chicksgrove.

#### Micro-Structure of Varieties of Chilmark Stone.

"Brown" Bed.—Made almost entirely of well-formed, fresh, oolitic granules adhering to each other, and partly, though very imperfectly, bound together by a rather earthy form of carbonate of lime. Quartz grains sparingly occur as the nuclei of oolitic granules. The stone is of a light-brown tint, rather open, and is not, we should think, a very durable material.

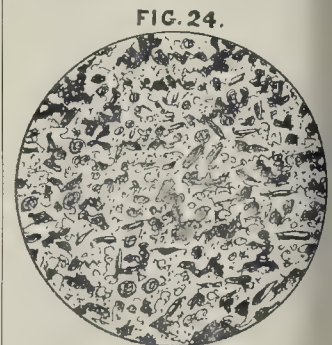


FIG. 24.—Micro-Structure of Chilmark Stone—"Hard Pinney" Bed.

"Pinney" with which it has considerable analogy, by the relatively greater proportion of minute, indistinct oolitic granules, by the smaller size of its free quartz grains, and especially by the abundance of granulated, flinty-looking silica, which together with well-formed calcite forms the matrix. There can be no question, from a scientific point of view, of the excellence of this particular bed of Chilmark stone; it is well adapted to withstand the action of the atmosphere in exposed situations. It is of a light, greenish-grey tint.

The following are the results of our experiments on these stones:—



## Experiments on some Physical Properties of Chilmark Stone.

	"Brown" Bed.	"Best" White" Bed.	"Bottom" White" Bed.	"Green" Bed.	"Soft" Pinney" Bed.	"Hard" Pinney" Bed.
Specific gravity .....	1.86	1.87	1.74	1.81	1.85	2.06
"    of particles .....	2.42	2.50	2.44	2.50	2.50	2.52
absorption .....						
In 1 second .....	8.82	6.00	6.71	5.69	5.19	2.53
In 1 minute .....	10.78	11.37	13.20	11.65	11.06	5.99
In 30 minutes .....	10.78	11.37	13.44	11.91	11.28	7.38
In 1 day .....	11.37	11.80	14.06	13.47	11.96	7.80
In 1 week .....	12.54	13.30	16.38	15.28	13.99	8.86

Examining the above table we note that the Hard Pinney bed has the greatest specific gravity, whilst it absorbs the least water. In the latter respect it agrees fairly well with certain of the beds in the Isle of Portland, but we do not desire to push the comparison too far, as the two kinds of stone are different in structure and in the method of weathering, though they are both raised from the Portlandian. All the Chilmark ones experimented with became almost thoroughly saturated within one minute after immersion, except the "Hard Pinney" bed. It is noteworthy that the "Brown" bed, which absorbed as much as 8.82 per cent. in one second the action being accompanied by a loud hissing sound, only arrived at 12.54 per cent. after being in the water one week; whilst the "Bottom White" bed, which merely took in 6.11 per cent. in one second, absorbed as much as 16.38 during the week—an enormous proportion. Speaking generally, our experiments show that the Chilmark stones absorb a greater proportion of water than either the Portland, Purbeck-Portland, or other. We regret that we are unable to include such as the "Trough" bed, which would have shown higher specific gravity and its absorptive capacity than any of the others, owing from its appearance and hardness. The decision is not of much moment, however, seeing that so little of the stone finds its way out of the strait.

## OBITUARY.

PROFESSOR CONSTANTIN LIPSIC.—We regret to announce the death of Professor Constantin Lipsic at Dresden. He was recognised as one of the leaders of the German architectural profession, and his wonderful industry was only equalled by the courtesy he showed all comers. Number of his buildings are at Leipzig, one of them being the church of St. Peter, which he designed together with the late Professor Hartel. His last work was the new Royal Academy at Dresden on the "Brühlische" Terrace, which is to be opened a few months hence. Among his most successful literary efforts may be named his essay on Gottfried Semper, the Architect. He was also distinguished as an orator, the last occasion of portance at which he spoke being the unveiling of a monument to Semper.

COLONEL W. HAYWOOD.—The death is announced in his seventy-third year of Colonel William Haywood, the Engineer of the City Commission of Sewers. Colonel Haywood became Engineer to the Commission in 1846, having been previously Assistant-Engineer. Only a few weeks he expressed a wish to retire from his position consequent upon ill-health, but the Commissioners of Sewers invited him to continue as Consulting Engineer at his full salary.

MR. HENRY SMYTH, C.E.—The death took place, the 14th inst., at his residence, Eastern Villa, Newcastle, County Down, of Mr. H. Smyth, C.E.

## GENERAL BUILDING NEWS.

COLLEGE, BUCKINGHAM.—A new college for the Anglican Order, designed by Messrs. Pugin & Ginn, is now in course of erection at Buckingham. The contractor is Mr. Tibbets, of Buckingham.

DRILL HALL, BRIDGEND.—A Drill Hall has just been erected for the Bridgend Artillery Volunteers. The ground floor of the structure consists of a hall, measuring 50 ft. by 75 ft., the armoury, and various offices. On the second floor is the drill-room, recreation-room, and the captain's office. Messrs. Lambert & Rees are the architects. Mr. W. Francis was the contractor. The cost £1,100.

CHURCH, NAIRN.—A new parish church is being erected at Nairn. Mr. Starforth, of Edinburgh, is the architect.

PARISH ROOM, DULWICH.—On the 10th inst. the Duchess of Teck laid the foundation stone of St. Vincent's new parish room in the Barry-road, Nairn. The building will adjoin the parsonage, when completed will consist, on the ground floor, of a hall, 72 ft. by 31½ ft., with an external staircase, two classrooms, a stone staircase leading to a gallery at the north end of the hall, a soup kitchen

or recreation-room, and a smaller hall, 64 ft. by 22 ft., the two halls affording accommodation for the boys and girls' Sunday schools, also for mission service, gymnasium, &c. On the upper floor over the two class-rooms will be a room, 24 ft. by 16 ft. Over the soup kitchen, library, and smaller hall will be the residence of the assistant clergy and caretaker. The building will be of red brick and Doulton stone, and the roof will be covered with red tiles. The great hall will face the Barry-road. At the side will be an archway, under which will be the entrance to a road which is to be formed giving direct access from the Barry-road to the west end of the church. A contract has been entered into by the Building Committee with Mr. G. Parker, of Peckham, for building the walls of the great hall and two class-rooms to ft. high from the floor with temporary roofs, windows, &c. The work will be carried out from the designs and under the superintendence of Mr. J. Stacey Davis, A.R.I.B.A.

ADDITIONS TO SCHOOLS, NANTWICH.—The National Schools, Nantwich, Cheshire, have recently been considerably enlarged by the addition of new class and cloak rooms, &c., at a cost of about £600. Mr. C. E. Davenport, A.M.Inst.C.E., was the architect, and Mr. J. T. Gresty, of Willaston, the builder.

NEW CHAPEL, DIOCESAN HOUSE OF MERCY, SALISBURY.—The Bishop of the Diocese recently dedicated the new chapel of the Salisbury Diocesan House of Mercy (situated near St. Martin's Church). The work of erection has been carried out by Messrs. Kite, of Fisherton, from the designs of Mr. G. H. Gordon, of Victoria-street, Westminster. There are lights in the apse in the chancel, filled with stained glass by Messrs. Evans, London. The central window represents the Virgin and Child, the window on the left Isaiah, and that on the right St. John. The altar is of carved cedar, and is the gift of Canon Kingsbury.

MESSRS. BRINSMEAD'S NEW PREMISES.—On Saturday last the new premises of Messrs. Brinsmead, the well-known piano manufacturers, in Wigmore-street, were opened by the holding of a concert open to the members of the Press. The architect is Mr. Leonard V. Hunt, A.R.I.B.A. The building consists of a ground floor and basement in the occupation of Messrs. Brinsmead, well marked out by polished granite arcading, the upper stories in a conventional mill design of red brick and stone, with somewhat feeble dormer gables being let out in flats. The ground story is occupied by the show rooms for pianos, two being devoted to grands, and the remaining seven to uprights. This floor contains all the offices and the waiting-room. The show-rooms are planned to such a size that they will take not more than ten pianofortes each in order that customers may not be annoyed by the tuning of instruments during selection. These rooms are divided by glazed partitions framed up, of sequoia wood, french polished, presenting a pleasing appearance and reflecting credit on the firm of Brinsmead, being executed by them at their factory in Kentish Town. In the basement, which also contains show-rooms, is a music room seating 130 persons. It is lighted by a large area, and also by the electric light, which is placed throughout the building; the room is fitted with fixed iron-framed chairs with rising seats, serviceable and suitable to the purpose, and the walls are lined with Minton's tiles, panelled with mirrors on the piers, and with Inlustrated panel ceiling and linoleum covered floor. This room appears to be suitable to the purpose of a small concert room, but has, unfortunately, little artistic character.

TECHNICAL INSTITUTE FOR RUNCORN.—The foundation-stone of a new technical institute for Runcorn was laid on the 14th inst. by Mr. Brunner, M.P. The building is being constructed from plans prepared by Mr. Bowden, architect, Manchester. It is estimated to cost £4,000.

ENLARGEMENT OF ST. PAUL'S CHURCH, PENZANCE.—The Church of St. Paul's, Penzance, which has been closed for a considerable time to allow of an enlargement being made as a memorial of the jubilee of the church, has just been re-opened. The enlargement consists of a reproduction of the 1843 church. The north wall and north transept have been taken down, and the roof of the old church taken up and supported by granite columns. New three-light windows have been placed in the gable of the eastern and western gable ends and filled with glass by Messrs. Fouracre & Co., Plymouth. A new serpentine font on an octagon granite base

has been placed near the north porch door; the chancel has been enlarged, additional accommodation has been made for the choir, and the lectern removed from the front of the chancel steps to near and in front of the pulpit. In the north gable and an entrance to the church from the school buildings has been made. Additional sitting accommodation for 160 persons has been provided for in the enlargement. The aisle floors are paved with Peake's tiles, the gas-fittings are supplied by Messrs. Willey & Co., Exeter. The alterations have been carried out at a cost of about £1,600, by Mr. W. H. Stephens, of Penzance, from the plans of Mr. J. W. Trounson, F.R.I.B.A., Penzance.

ENLARGEMENT OF THE GREAT EASTERN RAILWAY TERMINUS.—The Great Eastern Railway Company have now practically completed an extensive addition to their terminal station at Liverpool-street. The old terminus covered 9½ acres of land, while the new one extends over 5½ acres, making 14½ acres in all. Altogether there are twenty lines running into the station. The company having bought up very nearly the whole of the parish of St. Botolph, Bishopsgate Without, have, throughout a great part of the main street, cleared away and rebuilt the entire line of shops and houses on the west side. Among other property demolished was the interesting old mansion of Sir Paul Pindar. From the site of the property thus swept away something like 180,000 tons of earth has been excavated, the Great Eastern line at Liverpool-street lying considerably below the level of the adjacent street. In the place of the old buildings a new pile has arisen with a 500-ft. frontage of shops, three floors of offices over the shops, and a basement running down to the platform level of the station. The new extension of the station consists of five spans of glazed roof. At the end of the new lines there is a transverse span of roofing 90 ft. wide, to serve as a circulation space, in the middle of which are lavatories, &c. In order to keep this open space as clear as possible for traffic, the offices and lavatories are sunk underground. The station is lighted by the electric light; the electrical installation being set up at Norton Folgate, near Bishopsgate goods station. Under the goods station there is a hydraulic plant, for which two engines and pumps, each engine being capable of pumping 200 gals. of water per minute into the accumulator, under pressure of 750 lbs. per square inch, have been provided. Among the uses to which this hydraulic power will be put is the working of parcel lifts from the several platforms of the terminal station to the parcel office. This parcel office is erected on a bridge 120 ft. wide (50 ft. being devoted to the parcels office, and the remaining 60 ft. in roadways, each 30 ft. wide, on either side of the parcels office), carried upon cast-iron columns across the station, communication with the platforms below being by means of the lifts. For the working of the traffic running in and out of the terminus there will be two signal boxes. Messrs. Mackenzie & Holland, of Worcester, have contracted for the fitting of these, one of which will have 136 levers, and the other 240. Several contractors have undertaken different parts of the work. Messrs. Handyside & Co., of Derby, have carried out the roofing work of the station, the glazing of which will be on Messrs. W. E. Ransome's patent "Invisible" system, with 4-in. "rolled plate glass," the sash bars being of copper, with wood cores where the spans are long; the total area is about 720,000 ft. superficial. Messrs. Head, Wrightson, & Co., of Stockton, have contracted for the heavy iron work; the Horsley Company, of Tipton, have done the girders for the bridges; Sir William Armstrong & Co. the hydraulic works; Messrs. Davey, Paxman, & Co., and Messrs. Crompton & Co. the electric light installation; and Messrs. Mowlem & Co. are the general contractors for the excavations and for the building and construction of the line; the chief responsibility for the design and carrying out of the undertaking resting with Mr. John Wilson, the Engineer to the company.

## SANITARY AND ENGINEERING NEWS.

ELECTRIC PUMPING.—A large installation for this purpose is in course of construction by Messrs. Ernest Scott & Mountain, Newcastle-on-Tyne, for the Lothian Coal Company, at Newbattle Colliery, Dalkeith. The installation consists generally of:—Two horizontal engines each capable of developing 150 effective h.p. with a steam pressure of 100 lbs. per square inch; two "Tyne" dynamos each capable of giving an output of 60,000 watts, at a speed of approximately 60 revolutions per minute; two electric motors each of 60 h.p.; two sets of three-throw pumps each capable of delivering 200 gallons of water per minute against a head of 650 ft., together with conducting cables, &c. Two engines are provided for driving the dynamos; each of the horizontal long stroke type, fitted with Corliss valve gear in order to obtain the highest possible economy in steam consumption. It is proposed to add two additional engines, making four in all, as soon as the present plant is started; three of the engines will be used for driving three dynamos, the fourth engine being used for driving the screens and other machinery in the colliery. The four engines, as described above, drive on to a main countershaft running the entire length of the engine-house; this shaft is fitted with four main



driving pulleys for receiving the main driving belts from the engines, and four dynamo pulleys for transmitting the power from the countershaft to the dynamos. Each of the pulleys are fitted with clutches, so that they can be put in and out of gear as required, and by this arrangement any combination of engines and dynamos can be run as required. The dynamos are of Messrs. Scott & Mountain's improved mining type, each capable of giving an output of 60,000 watts, i.e., 120 amperes at an E.M.F. of 500 volts when running at a speed of 600 revolutions per minute. The armatures are of Messrs. Scott & Mountain's improved type, admitting of perfect ventilation and ready repair in case of accident. The armature cores are positively driven from gun-metal drivers fitting into three keyways in the discs. The commutators are of extra length and diameter to insure freedom from wear and tear, and are insulated with mica and mounted upon gun-metal sleeves, enabling them to be removed from the machines if required. The current from the dynamos to the pumps is conveyed by four cables. The core of each cable consists of 19 wires 13 B.W.G. insulated with a thick coating of bituminised fibre. The cable is then very heavily armoured with galvanised iron wires, the inner armouring consisting of 29 wires No. 11 B.W.G., and the outer armouring of 35 wires No. 12 B.W.G. The cables are made in 8 lengths with joints in the centres; these joints are made in junction boxes, so that they can be readily got at if required. The pumps are of the vertical three-throw ram type, each set of pumps being capable of delivering 200 gallons of water per minute against a head of 650 ft. when running at a speed of approximately 45 strokes per minute. The pump bodies for each set of pumps consists of three identical castings, interchangeable and fitted with glands bushed with gun-metal. The suction and delivery valve-boxes are all independent and fitted with an improved type of valve with double outlet. The connecting pipes are also interchangeable. This arrangement of pumps, valve-boxes, and connecting pipes enables the pumps to be run, assuming an accident should happen to any of the various parts. The power is transmitted from the countershaft, which runs in four bearings, to the pumps by means of two pairs of helical spur wheels and pinions, each pair of wheels being capable of transmitting the whole power if required. The motors drive the pumps also by two belts working on to two double-shrouded pulleys on the countershafts; each of the belts are capable of transmitting the whole of the power. The electric motors are similar in construction and design to the dynamos, and are each capable of developing 60 effective h.p. when running at a speed of 600 revolutions per minute.

**WINDMILL PUMPS.**—A 30-ft. diameter "Halladay" direct-acting windmill pump has recently been fixed by Messrs. A. Williams & Co., of London, over a shaft 130 ft. deep, at St. Austell, Cornwall. This machinery is delivering 5,000 gallons per hour into an elevated reservoir from which the surrounding district is supplied with water.

### FOREIGN AND COLONIAL.

**FRANCE.**—The last competition for the "Duc" prize having, as already mentioned, produced no result, M. Alfred Normand has appealed to the family of the founder to sanction some modification of the conditions attaching to the prize.—The Department of Fine Arts has decided to exhibit at the Luxembourg the collection of pictures left by the impressionist painter, Caillebotte.—The Department of Bâtiments Civils is occupied with a scheme for enlarging the Luxembourg Gallery, at present quite insufficient for the demands on it.—The official opening of the Champ de Mars Salon is definitely fixed for the 25th. The 20th, 21st, and 22nd will be reserved for art-critics, the 23rd for the President's visit, and the 24th will be a special day with a ten-franc entrance charge.—M. Albert Tournaire, architect, of Paris, and an old Prix de Rome man, has obtained the first premium in the competition for the buildings for the Bordeaux Exhibition of 1895.—The town of Orleans is to open, on May 5, a historical exhibition of the works of Orleans artists.—M. Frémiet, the sculptor, has completed for the Champs Elysées Salon a portrait statue of Meissonier, afterwards to be cast in bronze and erected on the Place de l'Eglise at Poissy, in front of the late painter's house. Meissonier is represented standing, in his painting-dress, and with brushes and palette in hand.—The old idea of erecting a statue to Bayard in the small town of Pontcharra-sur-Breda has been revived, and a public subscription for the purpose has been opened.—A new lycée was inaugurated a few days ago at Macon, from the designs of M. Guinet, a local architect.—A competition is to be opened by the Municipality of Autun for a new savings bank.—The jury in the competition for a hospital at Lorient have awarded the first premium to M. Charrier, architect to the Department of Morbihan.—There is a project for a new water supply to Cette by bringing the waters of the river Herault in a canal to that town.—There is talk of removing the ancient fortifications of Grenoble.—The Government is occupied with a

scheme for a railway from Biskra to Ouargla (Algeria), brought forward by M. Georges Rolland, engineer. The line will be carried to a distance of 700 kilometres from the frontier, and the project will have considerable importance in both a strategic and industrial sense.—The death is announced of the painter Eugène Lejeune, at the age of seventy-six. He was a pupil of Paul Delaroche and of Gleyre, and had figured in nearly all the Salons since 1845. Even this last year he contributed a water-colour. The greater proportion of his works, which were numerous, have been made generally known through engraving, photography, and various processes of reproduction in colour, notably the "Marchand d'Images," the "Lanterne Magique," "L'Enterrement d'un Petit Oiseau," "Le Petit Chaperon Rouge," "L'Oiseau Bleu," &c.—M. Turcan, the sculptor, has been commissioned to execute the statue of the celebrated French physician Fresnel.

**GERMANY.**—The mixed committee appointed by the Municipality of Berlin to confer with the executive of the proposed Berlin Industrial Exhibition has decided, after deliberating with the Works Committee of the exhibition, to ask for Government support with a view to a German National Industrial Exhibition at Berlin in 1896 or 1897. Chancellor Caprivi has, however, declined to pledge Government aid to any project going beyond the lines originally laid down. The scope of the exhibition having at length been settled, a sub-committee has been appointed to consider the merits of the statue of Germania by Begas, which has just been returned from Chicago, is being set up on the west front of the new Imperial Houses of Parliament. Herr Max Klein has just completed his group of statuary which will be placed over the main entrance, an Imperial crown flanked by symbolic figures.—The Ministry of Arts and Monuments, said to be that of Marcus Claudius Marcellus, the adopted son of Augustus.—The cost of the proposed Dortmund-Rhine Canal, the first link in the system which will connect the Rhine, Weser, and Elbe, is estimated at 2,800,000*l.*, of which 200,000*l.* is for purchase of land.—The new building for the Dresden Academy of Arts is practically ready, it has been carried out under the direction of Herr Lipsius, at a cost of nearly 240,000*l.*

**ITALY.**—The municipality of Venice have decided to hold biennial art exhibitions, when foreign artists will be invited to take part. The first is to be opened in April next year in commemoration of the silver wedding of the King and Queen of Italy.

**SWEDEN AND NORWAY.**—A commission has been appointed by the Swedish Government to draw up the programme of the Exhibition of Industries and Arts to be held in Stockholm in 1897. The Exhibition will be situated in the principal park in Stockholm, the Djurgård, abutting on the Lake Malaren. The main building promises to be imposing, and there are also to be the usual gardens, fountains, &c. around the buildings, whilst, on one side will, by that time, be seen the stately Northern Museum building in completed state.—The building societies in Christiania for providing comfortable and healthy dwellings for workmen, have now 464 such dwellings at their disposal, with some 2,000 residents. It has been abundantly shown that the health of the latter is far above that of workmen residing elsewhere.—The greatest private electric light installation in Norway is that now being introduced in the Grand Hotel at Christiania. The machinery will be capable of feeding about 1,600 normal glow-lamps. The installation is being carried out by a Norwegian firm.—A paper warfare is going on in the *Tidnings Ugeskrift* between Dr. Hans Reusch, the well-known Norwegian geologist, and Herr Trap-Meyer, a prominent architect, as to the suitability and solidity of granite for building material. The former maintains that for a climate like that of Norway granite is an excellent material, and points to Scotland, "where houses are built entirely of granite, even those of a cheaper kind." This view is controverted by Herr Trap-Meyer, who asserts that "in Scotland the walls of houses are nearly twice as thick as in Norway." Nor are the climates at all alike, as the mean temperature of Scotland is 50 to 52 deg. Celsius, whilst that of Norway is only 6 deg. This makes a very great difference. He considers the kind of granite mostly used in Norway for building and ornamental purposes one of the least suitable and reliable stone materials as regards solidity and strength. Nor is granite at all reliable in fire, which is due to its great tendency to absorb moisture. He quotes many proofs of this, from his own experience and that of fellow-architects. He speaks, of course, only of ordinary or common granite, not of the harder kinds. Even bricks are preferable to granite as building material. Build, he says, one chimney with the lower part of granite and one of bricks, fire in them, then throw water on both, and it will be found that the brick chimney has stood the test far better than the one of granite. However, in an abnormally moist climate, particularly on the coast, brickwork does not resist its influences. For instance, in the islands on the West Coast it has become necessary to board up the walls of several churches with boards.

### MISCELLANEOUS.

**ARCHITECTURAL ASSOCIATION.**—DISCUSSION SECTION.—A meeting of the Discussion Section of the Architectural Association was held at 36, Great Marlborough-street, W., on the 18th inst. when Mr. A. W. Cooksey, A.R.I.B.A., read a paper on "Architects' Holidays." The discussion was opened by Mr. A. F. Bolton, and continued by Messrs. Walter Millard, W. H. White, A. K. Satchell, S. K. Greenslade, Arthur Bartlett, A. K. Hart, W. Bonner Hopkins, Sidney Beale, H. Seales-Wood, and the Chairman, Mr. C. L. Brodie.

**THE SANITARY INSTITUTE.**—Sir Thomas Crawford's term of office having expired, Mr. Ernest Turner has been elected Chairman of Council of the Sanitary Institute.

**LONDON STREETS AND BUILDINGS BILL.**—A numerously-attended conference, consisting of representatives of Metropolitan Local Authorities and delegates from the Royal Institute of British Architects, the Institute of Surveyors, and the Builders' Institute, was held at the Vestry Hall, Paddington, on the presidency of Mr. R. F. Whurr, on Monday last. Mr. H. H. Collins, F.R.I.B.A., having furnished a lucid and exhaustive statement as to the general character of the Bill, the following resolution was passed with only one dissentient:—"That this conference, whilst fully admitting the expediency and justice of dealing with land and regulating the construction or re-construction of buildings thereon in such a manner as may be conducive to the public interest, considers that many of the clauses in the Bill are neither just nor expedient inasmuch as they would tend to check re-building, and injuriously retard the development of freehold and leasehold estate, and, further, that compensation should be given where property is taken under compulsion."

**CLOCK, CRETHERAM BATIS, MANCHESTER.**—A large clock, with four 5-ft. illuminated dials indicating the hours and quarters, has just been fixed in the tower of these new buildings. The work has been carried out for the Corporation of Manchester under the direction of the architects, Messrs. Booth & Chadwick, Manchester, by Messrs. John Smith & Sons, Derby, makers of St. Paul's Cathedral clock.—**SANITATION IN CORNWALL.**—From the monthly report of Mr. Silvanus Trevel, Chairman of the Sanitary Committee of the Cornwall County Council, we learn that during this month every sanitary district in the county has made a return with the exception of the Rural Authority of Penzance, and from that district a greater number of complaints of insanitary conditions have been received during the month than from any other in the county. The chief complaints have been the filthy condition of roadside refuse piles; over which there appears to be little if any check or control by those responsible for the abatement of the nuisances. Public inquiries respecting drainage and water supply have taken place during the month at Launceston, St. Ives, Portleven, and Downderry. Complaints continue to be made of inadequate water supplies at Bude, Newquay, Downderry, Phillack, Flushing, and Saltash. The Newquay Local Board reports that the Newquay and District Water Company are laying pipes from Rutherford to intersect the pipes at St. Columb-road, and that the shaft at Mount Wise has been built up and connected with the low-level reservoir by pipes. It is expected that the work now in hand will be completed by the middle of June next. The supply from Rutherford will be at the same altitude as the Quintrell Down reservoir; but the water to be pumped from the shaft at Mount Wise is intended at present to be thrown into the low-level reservoir, which serves only a portion of the district. Col. Hasted's report respecting Portleven supports the position taken by the Committee and the Local Government Board has requested the Helston Rural Authority to call in a competent sanitary engineer, and submit plans for a complete system of drainage instead of a piecemeal proposal. Typhoid appears again in this place. The report respecting Phillack does not appear to be so definite being confined to a request to call in an engineer and apparently leaving the initiative to the Local Authority, but at once resolved upon doing nothing as might be expected. It is not disputed that the district is without an adequate supply of pure water, and that much of what is now in use there is polluted. This is the result that has been achieved after correspondence, inspections, reports, &c., extending over a period of three years. Other places in the county are still worse off, for they have not yet reached the inspection, nor inquiry stage.

**CITY COMMISSION OF SEWERS.**—On Tuesday meeting of the City Commission of Sewers was held at the Guildhall. Mr. J. C. Bell, the chairman, referred to the great loss the Commission had sustained by the death of Colonel Haywood, its engineer—a loss not confined to the Commission nor to the citizens, but which would be felt by the metropolis in its widest-reaching sense. The Commission unanimously endorsed the expressions of sympathy and regret which the chairman had uttered. Mr. D. J. Ross was appointed temporary engineer, pending the appointment of a successor to Colonel Haywood. At the instance of the Finance and Improvement Committee 4,700*l.* was paid in respect of the further improvement of Widgate-street, an 1882*l.* of an improvement in Upper Thames-street. On the recommendation of the Streets Committee











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ington Astley Railway Station .....	6 0	6 0	5 7
esthropes Rulway Station .....	6 7	7 0	6 10
resherke Railway Station .....	7 3	7 0	6 10
ny, Warrak Railway Station .....	—	6 3	6 0
erford Railway Station .....	—	6 0	6 0
Kilworth & Welford Railway Station .....	—	6 0	—



**MALDON (Essex).**—For the erection of a villa residence, Causeway, for Mr. C. S. Polard. Mr. P. M. Beaumont, architect, Maldon. —  
J. Gossett ..... £325 0 | T. Wilking, Market Hall, £330 0  
Baxter ..... 157 10 | Accepted.

**MANCHESTER.**—For the construction of a flagged footpath, De Lacey's road, for the Preston & Union Guardians. Mr. John Thorp, architect, 48, Higher Blackley. Quantities by Mr. John Thorp, 48, Higher Blackley. —  
John R. Drinkwater, £109 10 | James Bacon, Black-  
France & Hughes, 178 10 | ley (accepted) ..... 175 0 0

**MANSFIELD (Notts.).**—For alterations to Girls' Grammar School, Mr. J. Osborne Smith, architect, 34, Southampton street, Strand, London, W.C. —  
Chas. Geo. Percival, £750 | H. Baker, ..... £650  
Fisher Bros., ..... 690 | W. Woodsend, Nottingham\* 648  
\* Accepted.

**MARYPORT (Cumberland).**—For the erection of a warehouse at Maryport, Cumberland, for Messrs. Carr & Co., Limited, Carlisle. Messrs. Johnstone Bros., architects, 39, Lawther street, Carlisle. Quantities by Messrs. Johnstone Bros. —  
Geo. McKenzie, £2,716 0 | S. McWhanney, ..... £1,694 17 2  
L. Ferguson, ..... 2,156 10 | Smith & Marshall, ..... 1,761 1 8  
James Beatty, ..... 5,070 0 | Maryport\* ..... 1,761 1 8  
\* Accepted.

**NEW SWINDON.**—For sewerage, metalting, paving, &c., Hunt-street, for the Swindon New Town Local Board. Mr. H. J. Hamp, surveyor, Regent-circus, New Swindon. —

Charles Williams, New Swindon ..... £155 9 9  
Charles Williams, New Swindon ..... 203 13 1  
Free & Sons, Maidenhead ..... 96 13 6

**OXFORD (Devon).**—For additions, &c., to school buildings, for the School Board. Mr. Harry Geen, architect, Okehampton. —  
James Julian, ..... £215 | Henry Harris & John  
Sleeman, Okehampton\* ..... £315  
\* Accepted.

**SOUTHAMPTON.**—For erecting a wholesale grocery warehouse, drying sheds, &c., for Messrs. Mitchell & Watson. Mr. H. J. Weston, architect, Southampton. Quantities by the architect. —  
Roe & Grace, ..... £2,585 | H. Stevens & Co., ..... £2,403  
Playfair & Toole, ..... 2,560 | F. Osman, Southampton\* ..... 2,440  
[Architect's protecting tender, £2,500.]

**SOUTHERNDOWN.**—Accepted for additions to "Glamore," Southdown, for Mrs. Thomas, the Heath, Cardiff. Messrs. Veall & Sant, architects, Cardiff. —  
E. Freese, Bangor ..... £295 0 0

**STANDON (Herts.).**—Accepted for building four residences in Standon-road, Standon, Herts., for Mr. Fred A. Ashton, architect, 3, Crooked-lane, E.C. —  
Chas. Chapman ..... £1,216 0 0

**STANLEY.**—For the supply of 1 1/2 m. yards kerbing, channelling, &c., erection of bridge, &c., South Moor, for the Local Board. Mr. Joseph Routledge, Surveyor, Local Board Offices, Stanley. —  
Alison, ..... £1,487 3 6 | Johnson, ..... £281 7 3  
Carnick, ..... 1,007 14 0 | Murphy, ..... 270 14 3  
Whitfield, ..... 992 4 0 | Simpson, Newcastle ..... 85 18 0  
\* Accepted.

**SWADLINCOTE (Derby).**—For the erection of two shops at Swadlincote, near Burton-on-Trent, for Mr. A. Riley. Mr. Arthur T. Greenwood, architect and surveyor, Woodville. Quantities by the architect. —  
Thos. Lowe & Sons, ..... £465 0 0  
Ernest Clarke, Melton Mowbray (accepted) ..... 437 0 0

**ULDALE (Cumberland).**—For the erection of school buildings, for the Governors of the Uldale Grammar School. Mr. A. W. Johnson, architect, 97, English-street, Carlisle. —  
J. R. Routledge, Meslgate, Carlisle ..... £285 10 0  
(For the completion of the whole of the works)

**USK (Mon.).**—For additions and alterations to the Priory, Usk, for Mr. R. Richards, J.P. Messrs. Veall & Sant, architects, Cardiff. Quantities supplied. —  
A. S. Morgan & Co., ..... £1,130 0 | Henry Parfitt, ..... £200 0  
E. C. Newby & Co., ..... 1,024 10 | Hatherley & Carr ..... 897 0  
John Jenkins, ..... 993 0 | Knox & Wells, Cardiff\* ..... 695 0  
\* Accepted.

**WARWICK.**—Accepted for the supply of Hartshill granite stone, for the Kington Highway Board. Mr. H. Treadwell, District Surveyor, Kington, Warwick. —  
C. Abell, Hartshill, Atherstone ..... About 2,000 tons at prices  
varying from 6s. 3d. to  
7s. 6d. per ton.

**WHITBY.**—For additions, &c., to the Mount Board School, Cliff-street, for the School Board. Mr. Edward H. Smiles, architect, 20, Skinner-street, Whitby. —  
John White, ..... £248 0 | J. Bevan, ..... £230 0  
Creswell & Langhorn, 68, 67 | F. W. Winterburn, ..... 560 10 0  
A. Palfreman, ..... 673 11 7 | William Langdale &  
Robinson Harland, ..... 640 18 0 | Sp. Whitby\* ..... 630 0 0  
\* Accepted.

**WINCHESTER.**—For the reconstruction of four arched bridges over the London and Basing-toke Canal. Mr. Jas. Robinson, C.E., 13, Southgate-street, Winchester. —  
J. White, ..... £1,885 0 0 | Murdock &  
J. Thorne, ..... 3,541 0 0 | Cameron, ..... £2,835 19 2  
Playfair & Toole, ..... 3,127 0 0 | J. Thumwood, ..... 2,766 10 2  
Jackson & Sons, ..... 2,028 0 0 | B. Cooke & Co.,  
G. Double, ..... 2,968 9 0 | Church-road, Batten-  
sea (accepted) ..... 2,341 0 0

**WINFORTON (Herefordshire).**—For the restoration, &c., of the parish church. Messrs. Nicholson & Son, architects, Hereford. —  
Henry Smith, ..... £1,697 | James Webb, ..... £1,415  
W. H. Morgan, ..... 1,590 | Charles E. Evans, ..... 1,397  
W. H. Smith, ..... 1,265 | minister (accepted) ..... 1,397  
Thomas Price, ..... 1,260  
[Architect's estimate, £1,430.]

**WOOLWICH.**—For the supply of granite road-metal, &c., for the Local Board. Mr. H. O. Thomas, Surveyor, Town Hall, Woolwich. —  
Wm. Gibbs, ..... £1,085 0 0 | A. & F. Maunelle, ..... £1,141 13 4  
Wm. Muir & Co., ..... 1,097 8 8 | W. Griffiths, ..... 1,183 6 8  
Mowlem & Co., ..... 1,150 0 0 | W. L. & J. Penn,  
Le Maître, ..... 1,210 0 0 | logs, ..... 1,071 13 4

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The Proposed Houses of Parliament at Berne.—Professor H. Auer, Architect. .... *Three Double-Page Photo-Litho's.*

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### the Ventilation of the Houses of Parliament.



FROM the period when our great legislative palace was built there has been a praiseworthy desire on the part of those who had official charge of the building that it should present, among other excellences, a model of efficient ventilation. With this view it has been the field of various successive experiments on a large scale, each of which turn it was supposed would completely succeed in rendering the legislative chambers cool of pure air. The collective experience of those who sit in these chambers, more particularly those who occupy the House of Commons, has, however, refused to be satisfied. It must be admitted that to supply fresh air in a manner which shall satisfy all the occupants in a room that holds several hundred people, and is from time to time crisscrossed to its full capacity of seat room, is but the most crucial test to which the resources of a ventilating engineer could be put. Not only is there the difficulty, a considerable one in any case, of supplying fresh air so that it shall be equally useful to all utilised by persons in all parts of the room, but there is the additional and almost insuperable difficulty of satisfying the various feelings and perceptions of an assembly of persons varying in physical constitution and habit of life, and who do not agree as to human requirements in the matter of air supply. What to one person seems only a sufficient change of air to properly healthful conditions, to another seems a lavish introduction of what he calls "draughts." It is hopeless to reconcile the evidence of these various witnesses; as a general rule it may pretty safely be assumed that it is those who require the fullest supply of air who are in the right, and that the objectors are probably people who are not in general living under healthy conditions; who coddle themselves from fresh air, and fancy every open window is a danger to health. If English people in general would open their windows freely in all weathers they would have better health, and would not get into that

morbid state of sensitiveness which regards every contact with the external air as a hardship and even a danger to health. Therefore, in dealing with the ventilation of a place in which many persons assemble, we should always be in favour of suiting the ventilation to the taste of those who desire most of it. The others may grumble, but they will be the better for it in the long run, even without knowing why.

Mr. Keith's report to the present First Commissioner of Works represents the latest proposal for the improvement of the ventilation of the Houses of Parliament. The report touches briefly on the historic side of the subject, so far as is necessary to expound the causes of present defects. At present the ventilation is entirely on the extract system (the extracting power being furnished by fires at the foot of the upcast shafts in the towers), except in regard to the debating chamber itself of the House of Commons, in which the indraught of air is assisted by propulsion fans, so that it is a combination of the plenum and vacuum system. These fans were, we believe, a somewhat recent addition, and we were told, in inspecting the ventilating arrangements of the building five or six years ago, that they were not very much used—only when specially hot weather rendered them necessary; but we presume from the terms of the report that their use has become more continuous since then. The air is warmed before entering the habitable parts of the building by steam-pipes, which in the case of the House of Commons are placed in a basement immediately under the House, but separated from it by a chamber which is called the mixing chamber, the function of which is to allow the warmth to be more evenly diffused through the air before it enters through the floor of the House.

The most obvious defect of the system is the extraordinary and insanitary idea of admitting air through the floor coverings which are trodden all day by the feet of the occupants, with the natural result of bringing up to some extent at least, into the House, the dust and lighter particles of dirt which have accumulated in the floor covering. It seems almost like a farce that the air is "washed" before being admitted into the heating chamber, when it is to be fouled in this way immediately afterwards. The original intention, carried out for a long

time, was that the whole floor should be a grated one, "covered with a carpet pretty open in texture, through which the fresh air would freely pass at a low velocity, and be equally distributed over the entire area of the various floors." As a means of distribution this was well enough, had it not been for the insanitary and disagreeable feature of coming through a trodden carpet. The carpet has been abandoned—we presume under the later perception as to its insanitary character, and the grated area is now more limited and covered with a coarse netting of whipcord, which is not so retentive of dust, and allows the heavier particles of mud, &c., from the boots of the occupants to drop through the grating. This is a degree better, but Mr. Keith does not in any way deny the objectionable nature of this mode of admitting the air, even under these modified arrangements; he only observes that an alteration in this particular would involve a reconstruction of the whole plan of inward ventilation, and therefore he contents himself with merely drawing attention to what he rather mildly calls "this undoubted weakness in the system." To have proposed such a reconstruction would probably have been regarded as going beyond his commission. Nevertheless we are of opinion that this reconstruction will have to be effected sooner or later, as the increasing sanitary sensitiveness of the day will not long tolerate the present method; and it may be a question whether the steps necessary to get rid of it had not better be taken into consideration at once, more especially as we shall see that it is one cause of the difficulty in securing adequate ventilation of the House of Commons.

The clumsy and antiquated extract force of the upcast shaft and fire Mr. Keith proposes to do away with entirely, rightly observing that such a system is inadequate from the fact that it acts less powerfully in summer, when rapid ventilation is most required, than in winter; it might be added that for such a complicated building, and for a debating chamber subject to such frequent and sudden changes in its numerical population, the system is additionally defective from the difficulty of regulating and rapidly varying the strength of its action. He proposes, of course, mechanical extract fans, which can be driven quicker or slower at any moment as required.



The third main defect noted in the report is the employment of steam-pipes as heaters. Mr. Keith finds that the gills or "batteries" placed on the pipes in 1854 by Sir Goldsmith Gurney, with the view of getting increased area of heating surface with a lower temperature, do not perform this office effectually, because the system of covering a certain proportion of the batteries with cloths in order to moderate the warmth when required (when the House is very full for example), operates in heating the plates so much while they are under cover, that they burn the air on removal just as much as the unadulterated pipes did before. The substitution of warm water for steam in the pipes would, he considers, meet the case by reducing the heat of the surface without rendering it necessary to lay down a fresh system of pipes. We presume it is considered that the "batteries" would be sufficient to give the area of heating surface which would be supplied by the increased area of the larger pipes which would otherwise be necessary when water heating was substituted for steam; though this point is not expressly touched upon.

We now come to the crucial difficulty in the case, and the one which has evidently more especially led to the present inquiry into the ventilation of the Houses; that is, the unequal supply of air in the House of Commons, where it has been found by observation and experiment that, whatever may be the condition of the air in the centre of the House, that at the sides is not pure. On this head the report says:—

"There is no doubt that a state of matters very far indeed removed from ideal ventilation, exists at present in the Houses of Parliament, and more especially in the House of Commons. Not only have I visited all parts of the Houses of Parliament, and remained there hour after hour, in order to find out the effect of the atmosphere upon me personally, but I arranged for several Members of the House, as well as other impartial and healthy persons from the outside, to sit for a few hours at a time in various parts of the House of Commons, in order to give me independent evidence of their experience, and their testimony in every instance was unfavourable. Healthy people accustomed to fresh air, and entering a building directly from the outside, are the best possible judges as to the condition of the atmosphere inside. The unalarming effect produced on persons visiting the House of Commons and sitting there, say, for from two to three hours, is, first, a feeling of drowsiness, after which pain over the eyebrows and headache are experienced, and then a feeling of lassitude and enervation ensues. These symptoms point most assuredly to a vitiated state of the atmosphere where these people were sitting."

We have some doubt whether this is not a little exaggerated; at all events, in sitting through a pretty long debate one evening in those Strangers' seats known, we believe, as "under the gallery," we were not conscious of any of these debilitating effects; but we must admit that the House was not by any means full at the time. However, the evidence that the ventilation is not equally good in all parts of the House seems unquestionable, and the reason for it, as hinted just now, is shown to be connected with the modification of the original system of inward ventilation all over the floor, coupled with the use of the propulsion fan. When the system was an extract only, and the admission was through the dusty carpet over the whole area of the floor, it is probable that the ventilation, however unsatisfactory in other respects, was more evenly diffused than at present. Now that the admission of air is only in the centre of the floor, and that an additional impulse is given to it by the propulsion fans, Mr. Keith shows that the result is that the main body of incoming air is sent up in a column to the ceiling, which is its only organised outlet, and does not spread sufficiently to the sides, where the air is apt to remain stagnant; and thus the very means employed to assist the propulsion of fresh air into the House militate against its effectual service in purifying the atmosphere. In fact it is expressly stated that in the House of Lords, which is ventilated only by extraction, and where the admission is still through the horse-hair woollen carpet over the chief

portion of the floor area, the fresh air (if it can rightly be called "fresh" after coming through that carpet) is much more evenly distributed, and there are not the same complaints as in the House of Commons. To meet this defect in the latter chamber, Mr. Keith makes what appears to us the rather curious and unscientific proposal to form other outlets under the galleries, to run the whole length of the chamber, and to be connected with the horizontal vitiated air-shafts above the division lobbies, or to the main down-cast vitiated air-shafts in direct communication with the Clock Tower up-cast shaft. He gives a section of the House, showing how the incoming air in the centre is thus to be partially deflected to right and left, to replenish the space under the galleries. We do not see that there is any certainty that it will do so. If the air is all drawn by a general extract power, it will surely take the most direct course and the course where there is the least friction, it will not go round by the conduits at the sides because Mr. Keith and the members in the side benches want it to do so, more especially when there is still the initial force pushing it vertically from the centre of the floor of the House. We do not believe this will answer, or it will only answer by chance; and we are quite at a loss to understand why Mr. Keith did not recommend the absolutely certain method of having additional *inlets* under the gallery, instead of outlets, and let the air driven in there find its way, as it undoubtedly would, to join the main column ascending to the ceiling outlets. The admission or propulsion of air into these now ill-ventilated portions of the house would be absolutely under control, and its action would be certain. We do not think the action shown on the section would be by any means certain or efficient, and we regard this feature in the proposed improvements as very doubtful indeed, and recommend the Office of Works to take another opinion before expending any money upon it.

We must repeat, however, our absolute conviction that the whole existing system of ventilation, which it is proposed to amend for the present as far as possible, will have to be re-arranged eventually, because the admission of air through the floor is a radically bad method. And we would press on those immediately concerned whether it would not be the wiser plan to reconstruct the whole ventilating system at one *coup*, rather than spend money on improving an arrangement which will never be satisfactory, and which is bound to go sooner or later.

#### HOW THEY BUILD AT NICE. (FROM A CORRESPONDENT.)

NICE, as every one knows, is the little Paris on the Mediterranean where the residents of northern climes who possess cash and leisure, betake themselves to avoid the rigors of winter and to enjoy themselves.

The bulk of the building work is done during the summer, between the months of May and October, when the visitors have flown, the hotels closed, and the town is left to its normal population. There is more than one reason for this. In the first place, most of the building work consists of repairs and additions to hotels, boarding-houses, shops, and the villas of winter residents. This, of course, can only be done during the time the buildings are unoccupied; but, apart from this consideration, any builder who should be venturesome enough to carry on building operations in the winter, except perhaps in a back street, would have an agent of police told off for his special benefit, and a single stone left for a moment outside his boundary, would be quickly followed by a *contravention* and its consequent *amende*. Therefore, it is not surprising that contractors prefer to indulge themselves in a little *dolce far niente* rather than to see all their profits eaten up by *amendes*.

But when the incoming trains are empty

and the outgoing crowded, then the sons of Italy swarm over the frontier, the noise of the saw and the hammer is heard in the land, and the air is redolent of Piedmontese and garlic.

The outside walls of most of the structures in Nice are built of rubble masonry and finished in stucco, the elaboration varying of course with the class of building. There are, however, some buildings having dressed stone throughout, but these are few and far between. The rubble work is solidly put together, but has not the workmanlike appearance of work done by English masons. Too many spauls are used to pack the courses, the masons not having the knack of fitting irregularly shaped stones one in the other. The dressed work is, however, equal to anything anywhere. The stone used is a local limestone, hard and durable. Large blocks for dressed work comes, however, from the Turbia quarries. There is an excellent local lime, but good sand has to be got by rail from Golfe Juan and other places. Good bricks are not obtainable from Marseilles, and are, therefore, expensive, and little used for thick walls. Inside partitions are mostly put up with hollow bricks. These are about 9 in. by 4 in., and vary in thickness from 1½ in. to 4 in., the ordinary thickness used being 1½ in. Fine mortar is used for this work, and partitions of, say, 15 ft. by 10 ft. are run up without any wood framing or binder whatever. To look at these partitions when being built, one would think that a vigorous push would cause a collapse, but in reality it would take a Samson to bring them down. The so-called fire-proof floors in good buildings are formed with iron joists about 3 ft. apart, arched between with 2-in. bricks on flat, the haunches being filled 1 ft. level with concrete. The floor is ordinarily tiled with 4-in. red pentagon tiles. It is, however, sometimes of cement or wood. The ceiling is formed with lath and plaster on joists in the usual way. Coke breeze and cement concrete floors have, however, been recently introduced. The roofs are covered with red tiles. This gives Nice a very pretty appearance when viewed from the surrounding heights. The old buildings have the old-fashioned taper tiles, met with all over France, but these are being rapidly replaced by Roman tiles.

The carpentry and joinery is much the same as English. The timber used is mostly Baltic; red Melèze (larch) is, however, largely used for roofing. The roofs are not very scientifically framed, parts often being in compression when they ought to be in tension, and *vice versa*. Pretty heavy scantling is, however, used, so that the roof hangs together by brute force. The flooring is always in narrow widths, grooved and tongued. For good floors solid oak parquet is used, laid herring-bone wise.

The joinery is, generally speaking, very good; on the whole, better than what is turned out of English workshops. The doors are not usually so thick as we make them, but the mouldings are struck on the solid and mitred, not planted on, as is usually the case here. The windows are generally casements opening inwards, and great pains are taken to make these weathertight. Venetian blinds are usually fixed outside, and often inside shutters as well.

Plasterers' work is pretty much the same as in this country. The outside stucco work is, perhaps, better finished, marble powder being used for the best work. Marble is extensively used for staircases, window-sills, floors, &c., and exclusively for chimney-pieces. Smiths' work is done at Nice in an excellent manner. Cast-iron work is, however, mostly imported.

The gutters, flats, &c., to roofs are of zinc, and are fairly well done, but the Nice craftsmen are no good at lead-work (nor, for that matter, Frenchmen generally). If lead-work is required to be done as it ought to be, English plumbers are indispensable. The French ideas of sanitary work is also very crude and behind the age. In this department, satis-



ry work can only be done by getting out from home.

decorative fresco work, the Italian man is *factice princeps*. He is in great vogue at Nice, scarcely a ceiling being left in all the town in plain whitewash. They are very quick at this work, covering a large wall with a really artistic design in less than it would take an English painter in a few lines. In fact, the way a design is under the hand of an Italian frescoer is nothing short of a revelation to the untutored Briton. Cornices and mouldings are painted and shaded in such a way as to give an appearance of solidity sufficient to deceive the unwary. In one case, an intricate design of mine, new to this kind of work, actually mounted a step-ladder to take the file of a cornice before he found that it was all on the flat. I am not to be taken as endorsing this kind of sham work. I only mention the existence of the fact.

In fresco work is not confined to the interiors, but the exteriors of buildings are decorated with a profusion of cornices, stringcourses, window-dressings, &c., all equally artistic, and in some cases landscapes and figures in perspective are added. The outsides of most of the buildings are red buff. This is rather at variance with the picturesque effect, the red roofs being only break in a monotonous splash of ochre.

The painting in oils does not differ materially from the same work in this country.

Building work is carried out on a different plan from what obtains here. There the local contractor is not often met with, being usually a separate contractor for trade. A contract for a lump sum is made, each trade working on a fixed price and everything being measured up on completion. When a job is given out to tender for each one tenders so much as to be below the tariff.

There is no machinery or appliances are used (except for joinery) either in the preparation of work or on the building itself, the materials, even for buildings four or five stories high, being carried up on men's backs.

On one occasion a man slowly climbing his way up a steep run with a large bundle on his back, I remarked to the contractor that in England a steam hoist would be used for that purpose. His reply was: "England you have cheap coal and dear labour; here we have cheap labour and dear coal so it comes to the same thing; besides, we have the custom of the country." This latter of the reply settled it. "It's the custom of the country" is the Nice native's *ultima ratio* in defending any stupid or obsolete way of doing things, and you would be considered very obstinate and disagreeable fellow if you continued the argument further.

Concluding work as to the comparative rates of Nice workmen. The labourers are not without exception Italians, and are very hardworking. They are paid about 1s. per day. A large number of masons are also Italians or of Italian extraction. They are not bad workmen, but do not kill themselves with hard work. "Why does that man take a heavier hammer?" I asked a foreman, pointing to a mason engaged in cutting out an opening in an old wall and who was leisurely tapping a stone with a brick-hammer. "Oh, I suppose he is tired," it would be too fatiguing," he replied in his best French, and then he mildly instructed with that mason in choice s. Contractors and foremen have to be careful how they speak to their workmen, these latter have their "syndicates," and employer gets on their black books he has some difficulty in obtaining good men in a busy time.

Nice it is the mason who fixes all the window-frames and door casings, &c., as well as floor joists and rough roofs. The heavy plastering is also done by masons. The joiners are, as a rule, fair workmen, benchwork especially being turned out

very clean and strong, but the fixing is not done so well. Roofing and flooring is done by distinct sets of men who do nothing else. The roofers do their work very rough, and the floorers (*parquetiers*) are not as good workmen as they might be. The plasterers proper do only fine work in plaster or stucco. They are excellent workmen; no better could be found anywhere. The fresco painters I have referred to before, and the ordinary painters are fair workmen.


A great drawback with all the workmen is want of proper tools. You never see a joiner with a good kit, and it is very rare that a mason has a spirit-level—or, indeed, a point or chisel. Many joiners hire their tools from the master, paying so much per week.

Like the British workman, his Nice brother often goes on the spree on Sunday, and does not turn up on Monday. The "Festel" is his great temptation. All trades receive from four to six francs per day of about ten and a-half hours.

In summer the hours are from six to seven, with half-an-hour for breakfast (eight to half-past) and two hours for dinner (twelve to two), but as the winter approaches the day is shortened and the dinner-time curtailed. There is no half-holiday on Saturday. The Nice workman does not care to work on Sunday, but will do so if required.

W. I. W.

#### NOTES.

 GOOD deal of interest has been felt as to who would be nominated by the Council of the Institute as the next President, and we have no doubt there will be general satisfaction when it is known that Mr. Penrose is the President proposed. His life-long association with the study and exposition of the noblest monuments of ancient architecture would render his acceptance of the office significant, at a time when it is certainly desirable for the Institute to show unmistakably that there is no intention of allowing it to become a mere surveyors' society.

WHAT was to be the German "National Monument" to the late Emperor William I., at a cost of about 400,000*l.* is now apparently going to be officially an "Equestrian Statue" to the deceased at half the cost. The Emperor's draconic ruling as to the position and conception of the monument, and his selection of the artist, so thoroughly displeased the country that its Parliament distinctly refused to associate the term "national" with so unpopular a memorial, and, though not averse to voting any reasonable sum for a Pantheon or other really representative monument to the old Emperor, declined to endorse so large an expenditure as 400,000*l.* for the realisation of what they only considered their ruler's whim. That even a sum of 200,000*l.* should have been voted is practically only due to the peculiarity of the case and the enormous prestige which the *sic jubeo* of a monarch has in Prussia. It appears after all, however, that the monument when complete will be practically the same thing as was originally suggested, whether called an Equestrian Statue or a "National Monument"; and the difference in cost will probably only mean a postponement in the completion of some of the many statues which are to be found room for under the arcades surrounding the monument proper. The work is going on now at Herr Begas' atelier. The models from which the bronze will be cast are well in hand. The Emperor's head, three times life-size, is practically ready for the foundry, and is considered a great success.

A PAMPHLET on the Eight Hours Day, by Mr. J. S. Jeans,\* written specially in reference to the late "experiments" in a forty-eight hours week, ought to be read by

\* The Eight Hours Day in British Engineering Industries. An Examination and Criticism of recent Experiments. By J. Stephen Jeans. London: Ballantyne, Hanson, & Co. 1894.

those who have been too much beguiled by Messrs. Mather & Platt's picture of the artisan cheerfully and economically accomplishing in eight hours what he used to do in nine hours. At Mr. Jeans' instigation a set of twelve questions were issued by the Iron Trades Employers' Association to a number of large employers, to which more than fifty firms replied. One of the questions (No. 11) was—"When the nine hours system came into force, years ago, did you find that the men worked proportionately harder, so as to produce as much with the shorter hours as with the longer hours?" The following are among the answers:—

"Not one jot more per hour than when ten hours were worked."

"No; we do not think there was ever a suggestion at that time that the men would work harder."

"No; not a fraction."

"When the hours were reduced from ten to nine, men worked no harder, but at the same even pace."

"No, decidedly not, even directly after the change, although distinctly promised."

"No, rather the reverse."

"The nine hours, when it came into operation, had with us a ruinous effect."

It is important to observe that the firms to whom these questions were put did not know that the answers were to be published. The answers, we are told, were given under the supposition that they were for the guidance of the governing body of the organisation to which the firms belonged. Another question put was—"Would it be possible to make up for the reduced time by any change in the rate of working the machinery, &c., or otherwise?" Among the answers to this question we take the following:—

"It would be necessary to introduce new machinery."

"If we knew how to increase the rate of working the machinery, we would at once do it, without waiting until the eight hours' movement is adopted."

"No; the machinery being worked to its utmost capacity, it would be impossible to make up for reduced time."

"Most certainly not. Machines are now run up to full speed; men might save a few minutes per day by increased attention."

"Possibly to some extent in time, but improvements in machinery and methods of doing work are continually being introduced, irrespective of hours of labour and rates of wages at any particular time, and this will always apply."

"No; the machine tools are speeded up so as to get the most out of them, consequently a reduction of the hours is a loss of production and cannot be made up."

"Impossible; cutting tools are now running up to the maximum speed, which, of course, cannot be exceeded."

Of course, every one knows that to do the work of fifty-four hours in forty-eight is not what the Trades Union leaders want. It is more and more evident that the experiment of Messrs. Mather & Platt, concerning which such a fuss has been made, was a spur made by the men under the incitement of the promise of a permanent reduction of hours on the same wages in case they succeeded in showing that they could do as much work in the shorter time as they had in the longer. As one of Mr. Jeans' correspondents says, it was "a measured-mile trial" lasting a year. People must be very simple, or very desirous to believe, who think that it will go on at the same rate.

IT was once said that no railway official is worth his salt who cannot make figures prove anything, and the remarks made by Lord Stalbridge, in introducing the deputation of railway directors and managers which waited upon the President of the Board of Trade last week, tend to show that railway officials may be equally relied upon to furnish figures which shall prove nothing at all. His Lordship was explaining the views of the railway companies upon the various points dealt with by the Government Bill and other measures now before Parliament, and, upon the question of analysis of rates, plainly intimated that such analyses, when the rate in question was below the maximum, would generally be fictitious. It was asserted that the respective sums representing the conveyance and terminal charges could only be properly apportioned when the maximum



was enforced, though it is rather difficult to see why the apportionment, if possible in the one case, should be impossible in the other. The companies always had a very strong objection to analysing rates, and now that they are compelled to do so, there will always, apparently, be a "glorious uncertainty" as to the value of the information afforded. This question is closely connected with that of private sidings, an analysis being generally essential in order to ascertain the amount of rebate due for services not performed by the company. Lord Stalbridge considers it impossible to deal with such questions in a general way, and that every siding must be considered on its merits. Mr. Mundella assured the deputation that the last thing they intended was to harass the railway companies, but he thought the action taken at the beginning of last year was a great mistake—in which his hearers were probably ready to agree with him. The coalowners have also interviewed the President of the Board of Trade on the subject, and were told that the object of the Government Bill was that every rate which had been raised since December 31, 1892, should be subject to revision by the Board and the Railway Commissioners; but they could not open up the consideration of every railway rate, however long it had been in existence. But although the operation of the Bill is thus limited, it was intimated that such matters as the substitution last year of the charge for 20 cwt. to the ton instead of 21 cwt., which was formerly allowed—indeed, any alteration in practice which has effected an increase of charge—would come within its scope. Those of our readers who have been prejudiced in the matter of computation of weight of timber and stone, would thus have a right to challenge the action of the railway companies.

WE print three letters on another page calling attention to the disgraceful licence which has been assumed and allowed in the debates of the Institute by an Associate member who seems to come to the meetings mainly with the object of advertising himself and insulting other people. One correspondent, an architect who is not a member of the Institute, but who was apparently present at the meeting, asks pointedly if this person is a specimen of the architect reared and fostered by the Institute; and if so, "who would be a member of it?" Of course it is not so, but we think the executive of the Institute have brought this on themselves by their lamentable want of firmness in repressing such behaviour. We have heard the person in question (we are not going to assist his desire to advertise himself by naming him) attack readers of papers on subjects which they understood and on which his opinion was worth nothing whatever, in a manner for which he ought to have been called to order from the chair, but never was. This counts from long ago, and before the reign of the present President, whom we do not wish to accuse of anything except too much good nature. But it is a plain fact that unless this kind of thing is stopped, the executive body of the Institute will have only themselves to thank if they find that those who have a claim to be considered as artists and gentlemen decline to attend meetings where they are to be subject to the interpellations and impertinence of a buffoon.

BY the second sub-section of Section 13 of the Settled Land Act, 1890, improvements are to include "Making any additions to or alterations in buildings reasonably necessary or proper to enable the same to be let." If an improvement falls within this limitation then it may be paid for out of capital when the estate or building is in the hands of a tenant for life. In the recent case of *In re Gaskell's settled estates*, reported in the current number of the "Law Reports," Mr. Justice Chitty had to deal with some interesting questions on this point. The mansion house owned by Mr. Gaskell "was old-fashioned and in a bad

state of repair," and having decided to let it this gentleman was advised that certain works were absolutely necessary if he wished to get a tenant. They consisted, among other things, of a new and efficient method of warming the house, an alteration in the main entrance which would provide a billiard-room and render the house less cold and draughty, and the restoration of the roof, which was in a most dilapidated condition. The judge held that the placing of a heating apparatus in a house could not properly be considered either an "addition" or "alteration," the billiard-room was in his opinion within the limitation, so was the new roof. We confess that there is some doubt as to the latter. "I come to the conclusion," said the judge, "that the placing of a new roof on this house, in substitution for that which for all practical purposes was not a roof at all, is an alteration to the building within the meaning of the section. This is a fair construction as between the tenant for life and the inheritance." Of course, many ingenious reasons may be advanced for and against the view, but we confess that a new roof in place of a dilapidated one is scarcely what most house owners or architects would regard either as an "addition" or an "alteration," since the latter appears to be some actual change of an existing part of the building, as the throwing out of a window on a blank wall. As to the heating apparatus, though it might reasonably be added by the Legislature to the things which may be paid for out of capital, it appears perhaps unfortunately not to be within the meaning of the Act.

THE case of the "Corporation of Sheffield v. Alexander and others," heard before Mr. Justice Charles and Mr. Justice Bruce the other day, an appeal from a decision of the local stipendiary magistrate, involves important issues for the Corporation. The gist of the case is that the Corporation desired to lay with new sewers certain streets which frontage owners, who would be charged with the cost of the work, asserted were already sufficiently sewered. Mr. Ellison, who appeared for the Corporation, explained that when certain of the houses concerned were built they were drained into the then nearest Corporation sewer; there was no sewer in the new street at all and the Corporation now claimed to have compulsory powers under their Act to make one. Mr. Ellison said this was an Act obtained by the local authority, and was for the making of better provision for private street works, and it would be a strange thing if the effect of the Act was to deprive the Corporation of the carrying-out of their principal duties. Apparently he took the position that the frontage owners had only power to object to the mode in which the work was to be carried out, and not to its being carried out at all; e.g., if the Corporation proposed a 9-in. pipe, the owners might object to that particular form or size of pipe, we presume. The judges, however, ruled that the power to object referred to the execution of the works, and not to the mode of executing them; that the Corporation were at liberty to make the sewers, but not to charge the frontage owners with them; that if they chose to have a uniform system of drainage for the whole of Sheffield, they could only insist on this at their own cost. This practically upheld the decision of the local magistrate. As a further appeal has been granted, we must reserve any comment on the case.

"IN the park at Clarendon," writes Camden, "are the footsteps of two royal palaces, King Manor and Queen Manor." This is the historical property of about 4,200 acres, three miles distant from Salisbury, that is now for sale. A royal forest in the Conqueror's time, it formed a favourite retreat and hunting seat of many English kings. It is notable also for having given a name to the "Constitutions" drawn up to regulate certain matters as between

the clergy and laity, *temp.* Henry II., a title to Sir Edward Hyde at his elevation to the peerage in 1661. The palace, traditionally styled King John's, must have of considerable importance. In Sir Richard Hoare's "Ancient History of Wiltshire" (1812-21) are cited from the Pipe-roll payment, 30 Hen. III., of 526*l.* 16*s.* 5*d.* one Nicholas for structural works; another, nine years later, of 6*l.* and 1*d.* for the making in New Forest of shingles and carrying them to Clarendon roof the king's palace, and also of 11*l.* 10*s.* 10*d.* for a further supply to the same amount. He describes the ruins as being about six acres in extent, composed of masses of masonry cemented together, overgrown with ivy and briar, with a lofty fragment of an outer wall, all lying in the south-east corner of an oblong enclosure, nearly seventy acres in area, marked out by a high ditch bank formerly retained with brick-work. Henry VIII. gave Sir William Herbert, K.G. (whose first wife was Katharine Parr's sister), the neighbouring abbey of Wilton, and in Edward VI.'s reign Herbert created Earl of Pembroke in 1542, and obtained a grant of Clarendon for his life and his eldest son's lives. In 1661 it was granted in fee to George Monk, 1st Duke of Albemarle, whose son Christopher bequeathed it to his relative, the Earl of Bath. Lord Bath's heirs sold the estate to Benjamin Bathurst, and in that family it long remained. In 1258 Henry III. gave the state from Clarendon to the dedication of Salisbury Cathedral; and thither, during the plague, Edward III. took his prisoners David of Scotland and John of France. Stephen Duck, the thresher poet, worked, as some say, on the Clarendon estate; and Massinger is supposed to have passed his youth at Wilton; "many years," he says to Philip, Earl of Montgomery, "I spent in the service of your honorable house, and died a servant to it."

WE fear it must be admitted that this year's spring exhibition of the Society of Water Colours is by no means so good and interesting as usual, although it includes, no doubt, some fine work. Mrs. Allingham's "In the Garden" (36), a beautiful study of flowers and foliage; the figure of a lady, larger and more prominent in the picture than is usual; this artist, is not so successful as her smaller figure of rustic life. Mr. Alfred Hunt's contribution is a rather curious study of "Niagara, after a Long Drought" (106), the falls showing only half the extent, falling water they are usually credited with. There is matter for study in it, of course, the artist has done many more interesting things. Mr. R. W. Allan has been painting effects of strong sunlight in Sicily, with suit his vigorous style and strong sensuous colour. Sir E. Burne Jones sends a small size study of his decorative group of knights at the Chapel of the Sangraal, a life-size tapestry of which was in the Arts and Crafts Exhibition. Mr. Goodwin's contributions are "St. Hilda's Abbey" (34), "Salisbury" (101), and several drawings on the screens of Avignon, Corfe Castle, and Mont St. Michel. The latter (227) a fine little study of morning light effect. Mr. North seems to be overdoing his special type of effect in drawing No. 22; this is not nature so much as a study of an artificial effect. Among landscapes which we should select as exceptionally good are Mr. Lloyd's "Sunrise on the South Downs" (112), Mr. Thorne Waller's "Haymaking near Findon" (110), Mr. Phillip's "Rocky Pasture-lands, Badminton" (153), equally solid in its lower portions as aerial in its sky, and Mr. Eyre Walker's "Nightfall on a Westmoreland Beck" (11) which for poetical suggestiveness combined with solid and broad style of execution.

\* Holbein designed the new house, for which Inigo Jones made a garden front. James Wyatt enlarged and altered the house, c. 1760, for the Earl of Pembroke. Montgomery, and Westmacott arranged his collection of sculpture and pictures.



sibly the best thing in the Gallery. As a sketch, Mr. Henry Moore's "Off the Hampshire Coast" (185) is remarkable in its indication of the run and movement of the waves receding towards the land. Mr. Herbert Marshall contributes some of his al studies of London street scenery, and is Rose Barton, in "The Royal Exchange" (7), palpably follows his lead. Mr. Guelin's rather slightly-executed studies w, to our thinking, much more real artistic ver than the more highly-finished oil- ings in which he has appeared as a er too palpable imitator of Mr. Alma- ema; that entitled "Rhodantha" (93), fine and original composition. Among scialities of this type Mr. Bulleid sends ood study, fine in colour, under the "A Morning Greeting" (1). Mr. Arthur ville's impressionist picture of "Tangiers" is as odd and not quite as clever in its as former efforts, or perhaps the novelty the trick is wearing off. Among the resting class of exhibits by eminent s who are not primarily water-colour- ters are two fine landscapes by Mr. ater, "Le Grand Nuveran" (15), a moun- scene, and the "Gate of the Wood" (93), h might do for the background of a e from the "Fœrie Queen." Professor omer sends a head of "Daphne" (27), a curious portrait (127) which the *Times* took for oil-painting (we cannot see look of oil-painting in it), and protested st its position in the exhibition, and h we took to be water-colour worked ely in heavy body-colour, but which Mr. omer in an explanatory letter to the s stated to be pure water-colour, so we ame it is executed with tube-colours on thick while moist; certainly it ars perfectly opaque. We hardly think result justifies the experiment. Mr. er Crane's "An Unsown Harvest" (20), dy of a field of weeds, is very interest- his figure subject called "Ensigns of ng" (146) seems to us more suitable for his charming children's books than 'serious' art. Among specially archi- al subjects not already mentioned are Rooke's "Mont St. Michel" (37), West a, St. Stephen's, Beauvais" (137), and 'Gougères Cottage" (206); Mr. Hodson's mb of the Emperor Maximilian, ruck" (97); Mr. Wallis's "A Street tro" (115), and Miss Montalba's "St. s" (59). The same artist's sketch of lo" (240) has a special interest as the of Browning's last poem.

OMPEIAN Wall Paintings" formed the subject of a lecture recently ured by Herr Ernst Berger at the ch Architectural and Engineering ty. Latterly the discoveries of ancient ings at Pompeii and Herculaneum have rise to much discussion as to the od by which these works of art, which exceedingly well preserved, were pro- d, and Herr Berger claims to have covered the long-lost art. In the course periments founded on hints contained ny's works, he succeeded in obtaining tremely pliable kind of wax, which he es to be the so-called "Punic wax," i can be mixed with water, and on sub- ant warming acquires a great consis- . Herr Berger exhibited a number ctures on which he had employed this rial. A patent has been granted to the or, who hopes that this method will avour for modern decorative purposes.

E have received a communication from the chairman of the Sanitary Com- e of the Corporation of Worthing, ying to the greatly-improved sanitary e of the town. Worthing is now supplied, e informed, with water from new tube a mile to the north of the town, which een certified by Dr. Klein to be of tionally pure character. Mr. Mansergh een given a free hand in regard to the vement of the drainage, and the whole s recommendations have been carried

out. To crown all, the Medical Officer of Health, Dr. Kelly, certifies that the death- rate for the quarter ending March 31 of this year was only 13·0 per 1,000. As some one says in the "Pilgrim's Progress," "the hearing of these things is enough to ravish one's heart."

#### THE ROYAL INSTITUTE OF BRITISH ARCHITECTS:

FURNITURE: DOMESTIC AND ECCLESIASTICAL.  
AN ordinary meeting of this Institute took place on Monday last, at No. 9, Conduit-street, Mr. J. Macvicar Anderson (President) in the chair.

Mr. W. H. White (Secretary) having announced the decease of Mr. William Haywood, better known as Col. Haywood, the Engineer to the City of London,

Papers (under the management of the Art Standing Committee) on "Furniture: Domestic and Ecclesiastical," were then read by Messrs. John Belcher, C. F. A. Voysey, Aldam Heaton, and W. D. Caröe, M.A.

Mr. Belcher observed that furniture might be said, primarily, to have had an independent existence, and was probably first designed for a migratory condition. With the fixed and permanent abode came the interlacing of the furniture with the building, such adjuncts being recognised under the term "fittings." They were the connecting link between the building and its furniture, whether of church or mansion. For transitory purposes furniture should be selected for general utility; it should be simple and serviceable, and of average size, and such as could be readily adapted to existing conditions. In the ideal state, however, when an Englishman's castle is really his own, we might be reminded that furniture has a place among the arts, and that, with the arts, its highest and best existence was in conjunction with architecture. When the structure was properly blended with its contents, when screens and panellings, cupboards, window-seats, chimney-pieces, and things half room and half furniture were side by side, then the movable objects should bear some relation to such fittings. For this pleasant consummation the architect should direct and influence the craftsman in the important matter of scale in the movable furniture intended for general use in his building; for it was of the utmost importance that it should be in due proportion to the room it was to occupy. The selection of disproportionate furniture was one of the commonest errors into which the inexperienced fell who purchased ready-made furniture exhibited in lofty show-rooms or warehouses. The question of cost invariably met us sooner or later, generally sooner; but in the matter of furniture, like many another, it was better to have a little which was good and serviceable, than to crowd the room with "display furniture." In an old mansion, provision might rightly be made from time to time for the display of heirlooms, or choice and valuable historical treasures which have been handed down from generation to generation; but the process of first purchasing fussy cabinets with numerous shelves, brackets, and bevelled glass cupboards, and subsequently filling them with articles bought specially to occupy the voids, was pretentious and foolish. The archaeological side of the subject was valuable in studying methods and examining results. It would be found that some of the best work was done between 1600 and 1660. There were in all periods certain recognised formulas which characterised good work. Mouldings, for instance, must be small and delicate, the carving soft and in low relief, with no high projections in parts or coarse bulbous forms. In all good work both form and construction were the result of long tradition, and one of the great charms was directness and evident fitness of purpose, as in the frank simplicity of the fitting up of St. Jerome's study, in the picture by Giovanni Bellini in the National Gallery. Undoubtedly furniture should be decorative; but it was an abuse of its purpose when employed as a means of decoration. After mentioning some opportunities for design, as in church furniture, organ-cases, &c., he observed that in all successful work there had been no hurry; undue haste was fatal to good work. In this hurrying and impetuous age the artist and craftsman must not be caught in the whirl, but must be content to produce slowly and deliberately, leaving to Tottenham Court-road and machinery the business of producing work in every known or unknown style as rapidly as would pall or fashion change.

Mr. Voysey, in treating of domestic furniture, said the subject was a most depressing one; there existed so little artistic reasoning. Rich and poor alike were content to order their furniture from the upholsterer, as they did their funerals from the undertaker. The result was very similar, the bill being the most lasting impression made on their minds. What they had paid was the measure of their greatness. The result of all this was that the architect, who laboured to attain dignity and breadth in his interiors, was exposed to the indignity of having all his work spoiled by the upholsterer. The client had often himself received an excellent education in decoration and furnishing from periodicals and handbooks. Therefore he felt any interference on the architect's part, in the choice of furniture and fittings, was rather an impertinence. For this state of things, in a great measure, we had to thank the spirit of revivalism. Museums and libraries, sketch-books and foreign travel, all these things, good in themselves when wisely used, were now being abused and misused to a very great extent. The god of commercialism was offering rewards all round to the best mimics. He must say here that this very condition, this imitative power which he deplored, had produced exquisite executional skill. But Art must be built up on a firmer basis. We must have a logical basis for our design in furniture; as in all else, laws must be discovered and obeyed. Then the best work would result from well-understood requirements. Things must change, and were changing. There was a widespread feeling that greater simplicity would lead to truer richness. We must restrain the carver, the inlayer, the polisher, and the metal-worker, and be careful that the thought in their design is as good as its execution. Also encourage them to concentrate ornament, and cease to use it as a means of hiding cheap construction and bad workmanship and material.

Mr. Aldam Heaton, in treating of the theory of hangings said that we got the word "hangings" from the Medieval house, where the tapestry hung loose, from rings and hooks. The present age had curiously transferred the word to the process of pasting paper upon the wall, where it did not hang. The use of hangings or drapery might be broadly divided under two heads:—I. An arrangement for obtaining warmth, or the appearance of warmth. 2. To break and veil the angular and hard lines of architecture, so increasing the æsthetic effect of an interior, and obtaining, at one and the same time, advantages both of form and colour. Now fabrics, to conform to the two branches of the theory, must (1) be fairly dense in texture, and in their nature suggestive of warmth and protection, and (2) they must be firm, not flaccid, and must go into good folds—the character of the folds being a matter of primary importance. The competition of the day, with its frantic haste to produce cheap and novel fabrics for the million, led to the excessive use of cotton, on account of its cheapness. A cotton fabric did not well conform to the necessities of either branch of the theory; cotton deteriorated most fabrics utterly. Of the fibres from which our yarns were made, I. wool was the most important. But what ordinarily came under that name must be broadly divided into two classes:—(a) Goats' hair, camels' hair, and the long wools of Iceland, Russia, England north of the Trent, and, generally, from the colder parts of Europe. This was rather straight, and was kept straight during all the manufacturing processes. We then called it "worsted." (b) Southdown, Saxony, Australian, and other wools from warm climates, which were comparatively short, fine in fibre, and full of wave, and were, for the most part, allowed to wriggle up and felt together, and were spun so, and called "woollen." II. Silk had, of itself, so little substance, and was so flaccid and springless that, used alone, it must either make a confessedly light and thin fabric, or an exceedingly costly one; but its lustre and texture were beautiful, as the face of a fabric, the backing being formed of long-haired wool or linen. III. Cotton was treated like long wool, the fibres being kept straight; but from its very nature it was flaccid and lustreless, and must always, as a fabric for hangings, hold an exceedingly inferior position. IV. Linen and jute, from their hard stiffness and entire want of spring, and inevitable tendency to crumple, held the same inferior position, though jute had been found competent to produce a fairly respectable velvet. In regard to decorative considerations, he should place any fabric high up in the list of what was desirable, if it went into good folds; this being a consideration of the first importance; colour and pictorial effect, though valuable, standing dis-



tinctly second. Damask weaving was too often spoiled in the endeavour to produce it too cheaply. Velvet, of course, took a high place. In regard to chintzes, the great facility with which patterns could be printed on cotton had resulted in chintzes being relegated to the bedroom, at 6d. a yard and upwards, usually on a transparent rag; but there was no reason whatever why chintz printing should not be on close and weighty worsted fabrics, and then the result would rank in the same list with worsted damasks. Lining fabrics, though manifestly quite subsidiary importance, should follow in texture the rules he had laid down; all the more since a crisp and springy lining might make up for the want of these qualities in a soft silk fabric, which, owing to the importance of the occasion, it might be necessary now and again to accept. Yorkshire tammy and merino, made entirely from long wools, were excellent. French merino, generally used for this purpose, was as bad as possible. To sum up, he had made a list of the most available drapery materials, in order of merit and demerit, with patterns laid upon the table, marked with corresponding tickets. He would offer the following list of available materials:—

*Good.*—(1) Old tapestry. (2) Twills, satins, &c., made from long wool or goats' hair. (3) Woollen cloth. (4) Silk, damask or plain, if firmly woven, or backed with cross-threads of worsted. (5) Oriental kelims and other tent coverings. (6) Velvet of mohair and wool. (7) Camelot and moreen; and woollen serge, if on a worsted warp.

*Bad.*—(1) Cotton velvet, plain or printed. (2) Low "art" serge on a cotton warp. (3) Soft cotton fabrics generally, whether plain or printed. (4) Silk plush.

The paper concluded with some remarks on the use of hangings in houses, and more especially in the sanctuaries of churches, where he thought they should be much more used than they generally were.

Mr. Carie, in offering some remarks on church furniture, spoke strongly against the prevailing taste for imitation Mediæval work—"art" altar rails at so much a foot, as per catalogue! "Art" pulpits in any style in stone or wood, ready for the choosing! "Art" stop chamfers, &c. He was not attaching blame to the manufacturers. It was the duty of every commercial man or company to make money out of legitimate business. He called in question the good taste, as well as wisdom, of those who accepted these things without protest. The designer of the building should design these fittings also. Articles of church furniture were not to be dealt with just as the ordinary furniture of our houses. In most instances they were essentials of the structure, often large enough—as in the cases of the organ, the reredos, or the screen—to do much to make or mar it. It seemed to him, therefore, to be the bounden duty of every architect who undertook the building of a new, or repairing of an old, church, to master every detail of its requirements, and so far as he could, to direct the choice of every accessory, even if he did not himself do all the designing. We had before us noble examples of success, where, as at Truro, every accessory, down to the altar plate, came from the same hand; and at Holy Trinity, Sloane-square, where a master mind guided his own and the work of other artists and craftsmen and brought the whole result to harmony. In dealing with woodwork he would express his unqualified horror of that typical speciality of pseudo-Gothic, pitch-pine, and the suggestion of stain. Considering the attempted slavish reproduction of old work which marked the early days of the Gothic revival, this prevalence of pitch-pine, a wood entirely unknown to our forefathers, presented a curious problem. Purity of style had been much written and spoken about, and he thoroughly believed in it as an education for the student. But Early English and geometrical woodwork had never seemed to him much worth our study except from the archeological standpoint. Modern wood design in these styles was, in the majority of instances, a total failure. For appropriateness and fitness to the material, even the Winchester stalls, fine as they are, must give way to those glorious examples of a later period, some of which were to be found in Langton's chantry and the Lady chapel of the same cathedral. It was a special quality of this later work that, with all its richness and wealth of ornament, it was yet in perfect harmony with the severest Mediæval surroundings, because the same inherent principles were to be discovered in both, widely differing though they might be in form and expression. In regard to the most important piece of church

furniture, the organ, it was remarkable that the modern builders of organs, with one or two notable exceptions, had failed so completely to recognise their responsibilities and opportunities in respect to the external appearance and fitness of their work. If the organ-builder added a case to his instrument, he dragged out a stock pattern, stop-chamfered Gothic, "very early," of the first quality. This, perhaps, he ornamented with some gilt-tipped ironwork, bedizened red and blue, which seemed to have had its origin in Coventry; metaphorically, perhaps, its most appropriate destination. At stencilling in varied coloured designs of the fleur-de-lis order, he had no rival. He contemplated his organ only as a huge square or oblong wind-box, and this, though he had numerous modern mechanical inventions at his disposal which made it pliable and manageable in an extraordinary degree—methods unknown to our predecessors who turned out those grand combinations and designs, so instructive for our study. Here, indeed, was a field for the architect who enjoyed openings for endless possibilities, a field which had been strangely neglected. True that it was full of technicalities and limitations which cross our path frequently; but the genial and accommodating organ-builder—when we were a fortunate enough to find him—could help us to a remarkable degree. It was not only a question of the organ case; fund also failed us to provide this. But the position, arrangement, and massing of the parts of the instrument itself were of first importance. If well done, the organ left only its skeleton could be made a fine object, and need never be an unsightly one while its grouped towers of pipes were awaiting their clothing. In designing a new church, not only should the position and magnitude of the instrument be determined at the outset, but in all cases should its grouping and case appear upon the original drawings, being fully as important in effect as any other portion of the structure.

During the reading of Mr. Aldam Heaton's paper, Mr. William Woodward, an Associate Member, rose on a point of order. He wished to know what the paper had to do with the subject before them?

The President said he very much regretted that such a remark had been made. The subject they were considering was "Furniture: Domestic and Ecclesiastical," and Mr. Heaton was dealing with the subject.

Mr. Alma Tadema, in proposing a vote of thanks to the readers of the papers, said that in a biography, published about him some years ago, a learned art critic said it was a pity he took so much trouble with cabbages and furniture in his pictures. In spite of that he had not changed his style; he was still fond of furniture, and, consequently, he was proud he had been asked to say a word that evening on that great subject—the subject of their comfort and of their life, if he might say so; because beautiful as architecture might be, to live in bare walls would not suit anybody, they required something to sit upon, something to eat from, something to study from, and something to put their things away in. He had been struck with one opinion, which had raised in his mind a doubt as to how far they were entitled to minimise the value of the efforts of these days. He was before all a child of the nineteenth century. Many might think that art was principally tradition. However, let them not be hard upon those who preferred one style of days gone by to another. The Gothic building of 1825 had the stamp of that year upon it, and so it would be for all time. They must apply to their wants a feeling of the art which had gone before them, and form could only be suggested by what they had seen; therefore, let them face the future in the continuation and in the study of what had gone before. They were in the pale of a civilisation that embraced all parts of the past. They were not like people in the Middle Ages, when one sentiment reigned throughout; everybody now was free to think as he liked, and thus there was much greater diversity and expression in art. Now, when they came to furniture proper, they found there also the archaeology, which a learned professor, a friend of his, told him thirty years ago, was the handmaiden of science, and he would add, she was also the handmaiden or the teacher of art. Looking then, he saw in the development of the history of furniture that the most primitive and oldest seat they knew of—viz., the Egyptian, was hollow, very comfortable to sit in, and especially a low seat. The Oriental, again, squatted on his heels, and he knew by experience that no European could sit in this fashion, because, when he wanted a model to squat down as the

Orientals did, it was impossible to find a European who could do it. The Greeks and Babylonians accepted the square seat, and then came the Romans, who had the square seat, which came down to our day, until the Americans invented the rocking-chair. From that they had come the more comfortable seat of modern days, and he believed that in the nineteenth century some more new forms would be invented. Mr. Belcher had rightly said, there should be ornamentation in the wrong place. Some friend of his brought from Germany a beautiful chair with a finely-carved knight in the centre of its back; but when he dropped down in that chair it hurt him for twenty-four hours afterwards. To make such things was not only wrong, but simply absurd. He considered that the finest furniture was certainly of the Chippendale and Sheraton time, and he knew of one chair of the last century which would be difficult to beat for comfort. It must have been a very clever architect who designed it—he might have gone under the name of an upholsterer, but he must have been an architect to design such a structure. Architects must supply them with houses, but it should be with comfortable houses, and with chairs which should be comfortable; he meant chairs in which one felt at home, not merely naked with

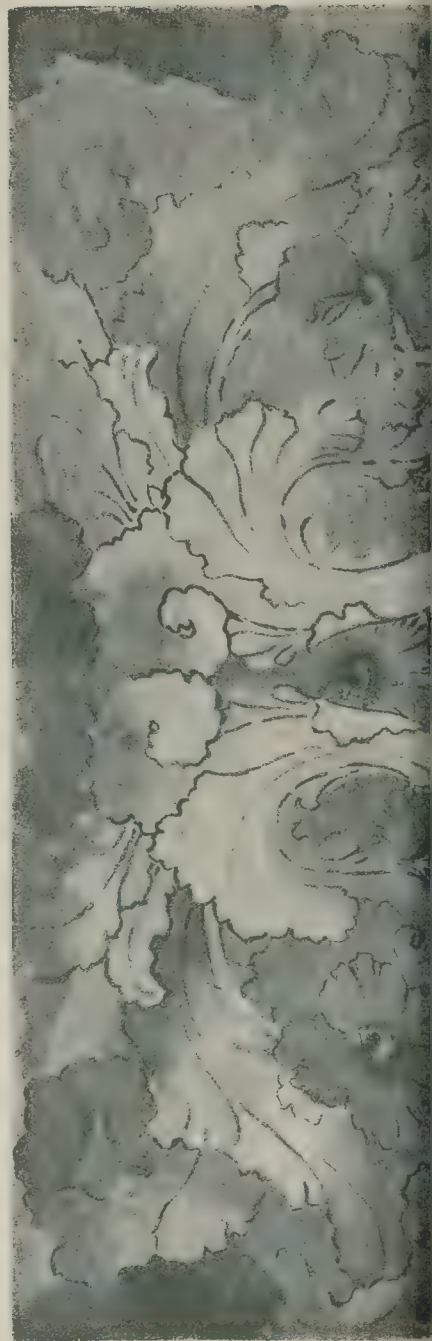
Lord Egerton of Tatton seconded the vote of thanks. He had had the opportunity of seeing furniture in most parts of Europe and of East, and he could confirm what had been said by Mr. Alma Tadema, that some of the old seats were the most comfortable. He lately had the opportunity of sitting in the marble seats in one of the theatres at Athens, where one could still see the name of the High Priest affixed to particular seats. A good many of the seats in churches were not half so comfortable and as modious as that provided for the High Priest at Athens, and, therefore, they had a good deal to learn from the ancients, and from all parts of the world, in regard to the comfort of their furniture. In the present day people were imitating a sort of furniture, and one of the latest ones seemed to be to imitate everything Japanese. No doubt they owed a good deal to the Japanese in the decoration of their walls of late years, but he did not think they should, at the same time, give up some of the finest specimens of furniture in different parts of Europe, and more especially in Italy. The carvings in the stalls and sacristies of some of the churches in Italy were more worth of imitation than anything to be found in any other part of Europe, and the Italian Government had done a wise thing in initiating a publication, *L'Arte Italiana*, which gave full-sized wing drawings of the most celebrated bits of architectural furniture. This publication, he believed, would be very useful to architects and decorators in this country. The remarks which he had made that evening with regard to good and bad hangings were very valuable, and, if they went back to some of the fine ornamental work of the last century, and the old-fashioned chintzes for the decoration of bedrooms in country houses, he did not think they could adopt better or more cheerful type. There was nothing more striking than some of the rude material found all over the East, and which contained patterns, designs, and colours handed down from very remote ages among people not highly cultivated or educated. These, seen under a brilliant sky, seemed susceptible of taking the most pleasing forms to the eye, and of being grouped in a most marvellous way, with an intuitive skill which some of our best decorators could not surpass.

Mr. Lees Knowles said that he had been much interested by the allusion, made by the author of the second paper, to the Rhea grass. It struck him as an exceedingly nice and serviceable article, and he believed it would have a stiffness which would produce the folds which would satisfy the author of the paper. It was one point in Mr. Carie's paper which struck him in particular, and it was this—that clergy, at the present day, had almost too much power—if he might use the expression—in regard to their churches. He could quote a case of a college friend of his, who was a rector of a most interesting church dating from many centuries, but, in the restoration of the church, not only had the rectorial taste to be considered but the taste of the rectorial sisters, cousins, aunts. It struck him that such an Institute of theirs might very well take into consideration how they could deal with such a case as this, because it seemed to him that one man ought to have the power of "restoring" a church, perhaps spoiling many of the features which had accumulated there for centuries. In the pre-





THE BUILDER, APRIL 28, 1894





DESIGN FOR WALLPAPER — BY MR. ARTHUR L. GWAHM





instance of this beautiful old church, they show sky-blue organ pipes, with lilies sprouting way, and an angel blowing a trumpet, on pipes. A new reredos had been designed, heaviness, which was a modern peculiarity, luced. The rector had handed the design to a mason, and all the beautiful detail had practically spoilt. In the case of the roofing, a piece of imitation had been done by the village carpenter, while the original architect had been trying to repair, rather than restore" the church, had all the credit put to him of the bad work.

Mr. William Woodward remarked that he had to no one in admiration for the perfect of a building in every particular, but these distinct difference between the architectural of a house and of the furniture. He sat in a very easy chair, and spent a great many hours at chair, though it had not been designed in architect, but by an artistic craftsman. An architect was to carry out his duty to clients and to himself, it would be utterly foolish for him to devote any time to designing chairs or wall or paper hangings. He would think a problem which, no doubt, would be useful to those who devoted the time they did devote to buildings to designing pieces of work. A builder called his attention to the fact that he had sent in a tender for some work, his tender was not accepted. In the work was a large quantity of lead, but it was a that the work was carried out with lead 1 lb. per foot superficial than his client ought to have. Now, the architect who allowed his to be robbed in that way, no doubt was of kind who wasted their time in designing a

Member rose to order and asked what this to do with the subject of furniture?

Mr. Woodward said his reply was that it had nothing whatever to do with furniture, but with business of the architect. In his own experience, the other day he had to reject two of bricks which were inferior in quality. The old foreman that those bricks must not go to the building, but they were taken to the works. Another architect, who permitted them to be at the loss of his client. He had no doubt architect was one of the sort who designed a table.

The President said that Mr. Woodward had said that he could appreciate furniture, because said he had the satisfaction of sitting in a "easy chair." He would ask Mr. Woodward to confine himself to the subject of furniture.

Mr. Woodward could only say that furniture, in nature of a chair or table, was not within the sphere of an architect.

The President: It is within the sphere of the meeting. The subject of the meeting is furniture.

Mr. Woodward said he would conclude his few remarks with one observation. If gentlemen called for a lesson in drawing, he would invite attention to the rubbishy drawings on the wall, and to the magnificent sketches by Augustus Pugin. There they would find the true test, designing everything relating to the building, and not wasting his time and his client's money in designing rubbish, such as they saw written there that evening.

Mr. Belcher asked that he might be allowed, as opener of the subject that evening, to be in his hands for the way in which the papers had been received. As far as possible the Committee endeavoured to choose subjects which would be helpful to their art and to broaden and in the views of the architect, taking his nose of drains, traps, and sanitary matters, was afraid that he must plead guilty to having needed furniture, papers, and curtains, though he did not know that he had sat in his "easy" perhaps so long as Mr. Woodward. They felt the subject to be a very large one, so that they were unable to particularise, much as they had liked to have done so. Probably, on a future occasion, they might be able to take the subjects separately, and deal with them at meetings.

Mr. J. Clayton said that Mr. Woodward had referred to Augustus Welby Pugin. He (the speaker) personally, and there was nothing Pugin had in so much as in designing all kinds of things which were not architecture. Chaises, tables, and everything that could be designed, were things which Pugin took a pleasure in signing, and yet it did not spoil his architecture. His (the speaker's) grief was not that Pugin designed other things than architecture, but that they did not do so half enough. He

spoke as one who had had his hand in architecture, sculpture, and painting, and if architects did a little more with the modelling clay and the palette, as well as with the T-square and the compasses, it would be better for all the arts. They knew how to sympathise with the sculptor, in the application of his art, and in that way there was to him abundant evidence that the divorce of the arts was a great grievance. They wanted architects to come out of the lines of pure architecture, and to come into the other arts, just as he would ask painters to design architecture, and sculptors to take an interest in it. The divorce of the three arts was the great disease which had affected them all.

Mr. J. D. Grace said that as a boy, he frequently saw Pugin design, and was very familiar with his personality, and with the extreme rapidity and practical aptitude with which he designed whatever he turned his hand to. What he attempted to do was apparent on those little slips of paper which were exhibited on the walls, one of which contained an almost complete design for a piece of furniture. Among the ten examples, none of which were bigger than half a sheet of cartridge paper, the most of them contained a complete design on one sheet, and not only the complete thing, in point of architectural design, but the constructional portion was shown in such a way that any person able to work well could carry it out.

Mr. Aumonier said that, in his paper, Mr. Voysey seemed to drop a remark to the effect that tradition should not be discarded. He wished to ask architects whether all great arts had not been carried on in the lines of tradition? He wished to know whether painting and architecture and all the great arts were not always worked upon tradition? Were they then to go back to a sort of babyhood of art, such as they saw at the Arts and Crafts Exhibition last summer? It seemed to him that there was no necessity to go back to the beginning of things, but it would take a great many of the modern designers to design a chair better than a Chippendale, and much of the old furniture was of the same excellent character.

The President remarked that there was an undoubted tendency, on the part of a portion of the public who occupied the position of clients, to put down the members of the profession as a sort of superior bricklayers, or even carpenters. As to being competent to advise on such subjects as decoration or furniture—far less to design them—was a thing out of the question. He thought it extremely desirable that the mind which had educated forms of proportion in a building, should have something to do with the decoration, and even with the furnishing, of that building. Nothing was, at times, so shocking, and discordant to one's feelings, as to enter a house one had taken some trouble in designing, and to find it utterly ruined by the decoration and the furnishing. Those who found time not simply to design architecture, but cognate subjects also, such as decoration and furniture, he believed were those who had not been found to occupy their time by constantly sitting in "easy chairs," but who had given their attention to designing whatever came before them, and was in relation to their building.

A cordial vote of thanks was passed to the readers of the papers, and to the various individuals and public authorities who had contributed the drawings on the walls; amongst others, to the South Kensington Museum, Messrs. J. L. Pearson, R.A., R. Norman Shaw, R.A., J. D. Grace, A. H. Hinton, W. Romaine Walker, J. Brooks, C. K. W. K. Shirley, C. F. A. Voysey, and G. F. Bodley, A.R.A.

The President added that the annual general meeting of the Institute would be held on the 7th of May, to discuss the annual report of the Council, to appoint the statutory board of examiners, to nominate the auditors, and to appoint scrutineers for the annual election. The proceedings then terminated.

**EPPING FOREST.**—With reference to the thinning of Epping Forest, regarding which certain statements have recently been published, Mr. James Salmon, the Chairman of the Epping Forest Committee, writes:—"Four thousand eight hundred and six trees, not thirty thousand, have been felled in the season 1893-4 in Epping Forest, Wanstead, and Higham Parks (an area of about ten square miles), the greater part of these being small pollards 6 in. in diameter, and very many dead or decayed. When the cost of cutting and drawing has been paid, little or no profit remains, and last year the sum of 3,600*l.* was placed by the Corporation to the Epping Forest Fund to meet annual expenditure.

## AWARDS AT THE CHICAGO EXHIBITION.

We have at last received, through the Society of Arts, what purports to be a complete list of the awards given in the English section at the Chicago Exhibition. The awards are all of equal value, the additional complication of medals of different values having been, perhaps judiciously, avoided. We give a list of those which bear on subjects of interest to our readers. As these are picked out from a great number of different "classes," sometimes only one from one class, and as most of these explain themselves, we have not attempted classification except in the case of sculpture, painting, engraving, and architecture, which form more specially-defined groups than the others. The remainder we give under the head of "Miscellaneous," which heading refers only to our own extracts:—

### Architecture.

Prof. George Ainsworth, A.R.A., London; R. Rowand Anderson, LL.D., Edinburgh; George C. Ashlin, R.H.A., Dublin; Aston Webb & E. Ingress Bell, London; James Brooks, V.P.R.I.B.A., London; Ernest George & Peter London; Thomas G. Jackson, A.R.A., London; Alfred Waterhouse, R.A., London.

### Sculpture.

Edward Onslow Ford, A.R.A., London; George Frampton, A.R.A., London; W. Goscombe John, London; Sir Frederic Leighton, Bart., P.R.A., London; F. W. Pomeroy, London; John M. Swan, A.R.A., London; Hamo Thornycroft, R.A., London.

### Paintings in Oil.

Miss Anna Alma Tadema, London; L. Alma Tadema, R.A., London; Mrs. Alma Tadema, London; W. H. Bartlett, London; G. H. Boughton, A.R.A., London; Frank Bramley, A.R.A., Penzance; Frank Brangwyn, London; Frederick Brown, London; Lady Butler; William Carter, London; James Charles, Hosham; George Clausen, R.I., Newport; Frank Dicksee, R.A., London; Alfred East, R.I., London; S. Melton Fisher, London; Horace Fisher, London; Morley Fletcher, London; Mrs. Stanhope Forbes, London; Stanhope A. Forbes, A.R.A., London; F. Goodall, Dulwich; T. C. Gough, London; A. C. Gove, R.A., London; Peter Graham, R.A., London; Arthur Hacker, A.R.A., London; Professor H. Herkomer, R.A., Bushey; J. C. Hook, R.I., Farnham; Colin Hunter, A.R.A., London; G. W. Key, London; Yeend King, R.I., London; H. H. La Thangue, Bosham; John Lavery, Glasgow; B. W. Leader, A.R.A., Guildford, Surrey; Sir Frederic Leighton, Bart., P.R.A., London; Sir James D. Linton, P.R.I. London; William Logsdail, London; Mount Loudan, London; Seymour Lucas, A.R.A., London; Robert W. Macbeth, A.R.A., London; Mrs. Anna Lea Merritt, Andover; Sir John Everett Millais, Bart., R.A., London; Miss Clara Montalba, R.W.S., Venice; Albert Moore (the late), London; Henry Moore, R.A., London; P. R. Morris, A.R.A., London; David Murray, A.R.A., London; W. Q. Orchardson, R.A., London; Walter Osborne, R.H.A., Dublin; W. W. Oulless, R.A., London; Alfred Parsons, R.I., London; Ernest Parson, London; Miss Henrietta Rye; John R. Reid, London; Briton Riviere, R.A., London; James Sant, R.A., London; J. J. Shannon, London; Solomon J. Solomon, London; Adrian Stokes, London; Mrs. Adrian Stokes, London; Marcus Stone, R.A., London; Edward Scott, Amberley; William Scott (of Oldham), London; John M. Swan, A.R.A., London; Mrs. Annie L. Swynnerton, London; A. Chevallier Taylor, London; Leslie Thomson, London; Wm. Holt Yates Titcomb, Batham; Henry S. Tuke, Hanwell; J. W. Waterhouse, A.R.A., London; Ernest A. Waterlow, A.R.A., London; G. Wetherbee, London; Miss E. Stewart Wood, London; Henry Woods, R.A., Venice; W. L. Wyllie, A.R.A., Rochester; Charles W. Wyllie, London.

### Paintings in Water-Colours.

Mrs. Allingham, R.W.S.; L. Alma Tadema, R.A., London; H. Coutts, Windermere; Alfred East, R.I., London; Birket Foster, R.W.S., Witley; Sir John Gilbert, R.A., Blackheath; Andrew C. Gow, R.A., London; Miss Kate Greenaway, London; W. Hatherell, R.I., London; Edwin Hayes, R.H.A., R.I., London; J. Henry Henshall, R.W.S., London; Henry George Hine, V.P.R.I., London; Walter Langley, R.I., Pevensey; Sir James D. Linton, P.R.I., London; Tom Lloyd, R.W.S., London; Henry Moore, R.I., London; Alfred Parsons, R.I., London; W. Rainey, Chichester; Leopold Rivers, London; Lionel P. Smyth, London; E. A. Walton, A.R.A., Glasgow; W. L. Wyllie, A.R.A., Rochester.

### Engravings, Etchings, and Prints.

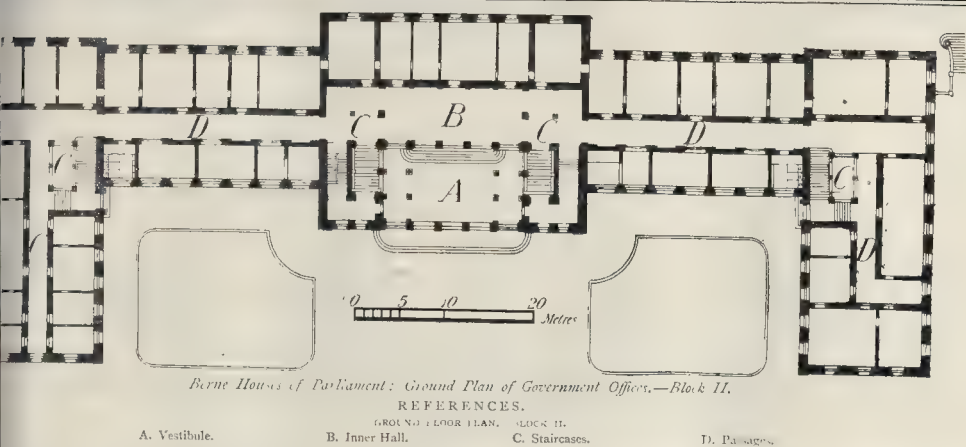
D. Y. Cameron, Glasgow—Etchings; Herbert Dicksee, London—Etchings; W. Biscombe Gardner, Haslemere—Engravings; W. Seymour Haden, P.R.P.E.—Etchings; William Hole, R.S.A., Edinburgh—Etchings; David Ibbotson, London—Etchings; Leopold Ibbotson, London—Etchings; Robert W. Macbeth, A.R.A., London—Etchings; Mrs. Lionel King, Marton, London—Etchings; Mortimer Menpes, R.P.E., London—Etchings; Gerald Robinson, Leatherhead—Mezzotints; Charles William Sherborn, London—Engravings; Chas. J. Watson, London—Etchings.

### Miscellaneous.

Bombay-Burmah Trading Co., London—Timbers and plank of teak wood.  
Farmer & Brindley, London—Egyptian porphyry; imperial Egyptian porphyries.  
John Dean & Co., Liverpool—Slabs, plain and enamelled.  
Farley Iron Co., Limited, Leeds—Fire-clay, glazed bricks, porcelain baths.  
Albion Clay Co., Limited, Burton-on-Trent—Fire-clay bricks, terra-cotta, &c.  
Francis & Co., Limited, London—Cement and whitening work done in cement.  
East Anglian Cement Co., Shepreth—Cement (materials, products, and tests).  
Irish Portland Cement and Brick Co., Limited, Dublin—Portland cements and products.







system of the Art Union of London tends to a proportionally wide distribution of its works to all parts of the world where English is spoken, and the feeling that a serious responsibility rests upon the Society to ensure that in its productions the representation of British art shall be jealously maintained. The share of this responsibility which falls to the individual members of the Society is, first, in the general duty of maintaining, and, secondly, in the support given to the Society in its corporate capacity, to enable it to set a high standard in the work produced in the exhibition, and, further, in the special case of those prizes, the duty of selecting pictures with care and judgment as to ensure that the system shall operate for the encouragement of the best artistic work available."

Chairman, in moving the adoption of the resolution, stated that during the past year 500 new members had joined the Society. T. Buxton Moorish, Hon. Sec., seconded the motion for the adoption of the report, which was carried.

Thanks were accorded to the Honorary Secretaries, Mr. John Sparkes and Mr. T. Buxton Moorish; to the Secretary, Mr. Harrison; to the officers; and to the Society of Arts for the use of the lecture-hall for the exhibition. Drawing for the prizes was then proceeded with, the first prize (Mr. F. Goodall's "Reverie") falling to Mr. C. A. McBeam, of Northampton.

### COMPETITIONS.

**NEW HALL, HAMMERSMITH.**—We are informed that it has been decided that the plan for the proposed Town Hall accepted by the Council shall be sent to the London County Council for approval, but that no further steps will be taken in the matter "for the present," until after the election in November. **POOL, NORTH SHORE.**—We understand the design for the North Shore works, submitted by Messrs. J. E. G. Stead, Manchester, as joint engineers, has been accepted by the Corporation of Blackpool as one out of some twenty designs submitted for consideration and final decision. The estimated cost of the works is 50,000.

**LEGAL BUILDING, KINGSTON-ON-THAMES.**—The Architects' Land and Mortgage Corporation, Ltd., received sixteen sets of designs in this connection in response to their invitation to architects to submit designs for the new building. The directors appointed Mr. James F. Jones, 42, Old Broad-street, E.C., assessor, who will select the first prize to Messrs. Philip A. and Frank Lishman, of 64, Great West-minster; and the third to Mr. W. M. Jones, of 8, Bettridge road, S.W., which the directors have approved.

**SANITARY INSTITUTE CONGRESS.**—For the first time, it is to be held at Liverpool, commencing on Saturday, 24th, Mr. G. F. Deacon, M.Inst.C.E., accepted the presidency of Section II—Engineering and Architecture.

### Illustrations.

#### DESIGN FOR WALL-PAPER AND FRIEZE.

**THIS** design is based on the natural form and colour of the Yellow-Horned Sea-poppy (called "horned") on account of the peculiar form of the seed-vessel; the colour of the blossom is a pure yellow, while the leaves of the plant have a cobalt blue-grey bloom which characterises many sea-loving plants. These colours were retained for the blossoms and leaves respectively in the original coloured design, of which this is a monochrome reproduction; the background, where it is shown, being a much deeper shade of the blue-grey.

In connexion with this design Mr. Gwatkin writes to us in regard to a practical point:—

"The attempt to use transparent colour in the printing or stencilling of wall-papers has hitherto been attended with very little success. The difficulties are well described in the *Magazine of Art* of April, 1892, by Mr. Lewis Day, who, in criticising attempts of mine, writes:—

"You cannot by stencilling in water-colours make sure of uniformity of tint; the inequality of transparent colour, as compared with flat distemper tint, is, indeed, its charm, but when you come to hang one breadth of stencilling in water-colour by the side of another there are sure to be differences of depth which draw undue attention to the joints, and give the appearance of stripes."

After this criticism, quite kindly offered by the father of the subject, I gave up the attempt until lately, when an idea occurred to me of controlling these differences of depth, or, rather, of rendering them unobjectionable. The proof of the design you have sent me, which was drawn for transparent

colour, now that I have marked the joint down with my pen,\* illustrates the means adopted, which, I am glad to say, has entirely removed Mr. Day's objections to the use of transparent colour work. I find a wall-paper designed to be produced by this method shows its joints less evidently than the ordinary block-printed paper.

It may occur to you that trimming is rendered very difficult by the intricacy of the joint, but this is overcome by the use of a knife and a metal template. The increased cost of hanging is about half as much again as in the ordinary way."

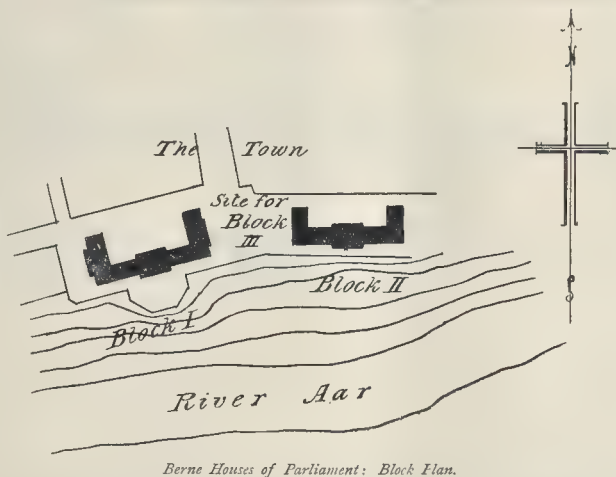
#### THE NEW HOUSES OF PARLIAMENT, BERNE.

On the several new public buildings under discussion in the spring session of the Swiss Parliament, and now definitely sanctioned, the most important one was the proposed new home for the country's representatives, who are at present housed in the older of the two large Government blocks at Berne. These have, until to-day, together served as the combined legislative and administrative centre of the Republic.

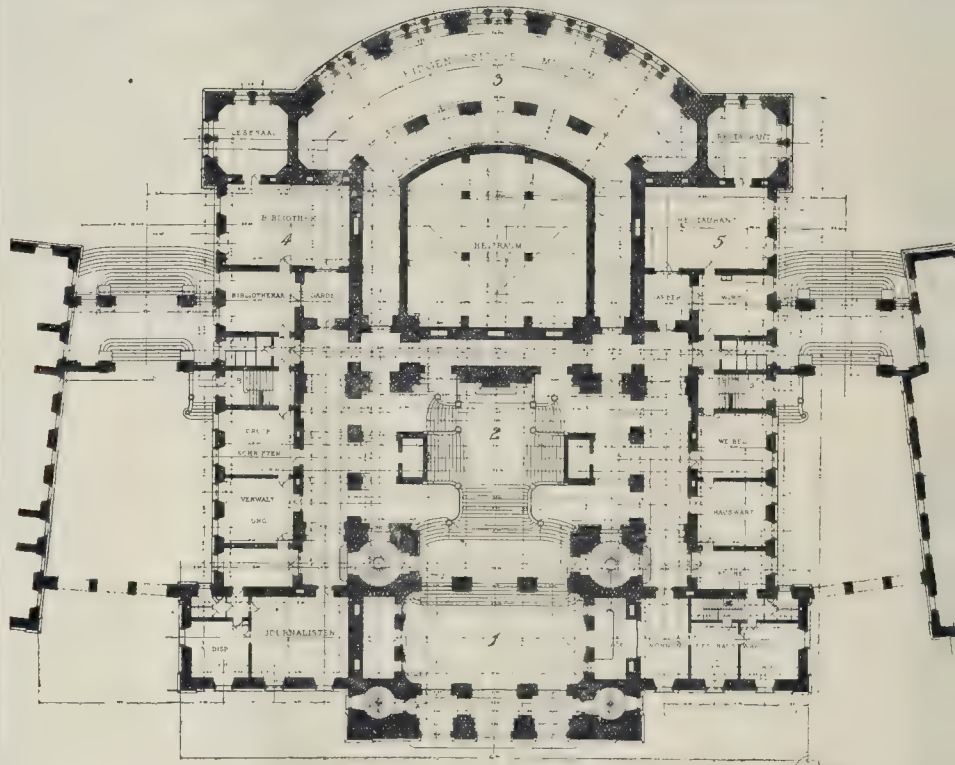
The new house, which is to be an extension, or, more properly, "junction," between the two blocks, is to be Switzerland's *band-side* "Houses of Parliament," and the idea is that this block, together with the two older ones, which will then be used for administrative purposes only, should be treated as one architectural group.

The position of the two existing blocks is certainly unique, situated as they are some 120 yards apart on a height overlooking the valley of

\* The joint is carried round some of the lines of the floral design, somewhat as in leading a pattern in a window, instead of making a straight joint direct through the pattern. E.D.







GROUND FLOOR.

*Swiss Houses of Parliament: Plan of proposed New Building, Block III.*

(For Scale, see First Floor Plan, p. 329.)

## REFERENCES.

GROUND FLOOR PLAN.—PROF. A. A. A. A. A.

1. Vestibule.

2. Hall.

3. National Museum.

4. Library.

5. Refreshment Room.

the Aar, with the Alps beyond. The ground between the two blocks can now be had, and the Swiss Government may well be congratulated for at once encouraging what will not only fulfil a long-felt want, but at the same time be the realisation of a monumental group of buildings. The design we illustrate is, we believe, the outcome of a limited competition between Professor Bluntschli, of Zurich, and Professor Auer, of Berne. Professor Auer's design has been given the first place after much discussion. He was the architect of Block No. II., which was completed two or three years back, and of which we also now take the opportunity of showing some views.

The oldest block, No. I., was built in 1852-1857 by Messrs. Stadler & Studer, to contain both the Administrative offices of the Government and the two Council Chambers used by the people's representatives. Block No. II. was practically an extension necessitated by the dearth of office accommodation.

The ground floor plan of this Block No. II. explains itself, containing, as it does, simply a row of offices with ample passage space and staircase accommodation. On this floor the architect only made a feature of the vestibule and inner hall, in which he relied to a certain extent on the colouring of the materials. The vestibule we illustrate. The first floor plan repeats itself with the exception of the central part, which contains a large committee room. Over "B," the inner hall, is a *foyer* which has also been made a feature of by the architect. Of this part we likewise show a drawing—i.e., the view towards the openings overlooking the vestibule below. The block has façades of a national stone, and is built as strongly as possible. The elevations had, to a great extent, to match those of Block No. I. with the exception of the centre, where a slightly different treatment was allowed. The total length of this building is 108 metres, or 354 ft., the vestibule measuring 15 by 8 metres, or 49 by 26 ft.

As to the proposed Block No. III. we understand that Herr Auer has already practically given part of his time to its planning for some ten years, commencing with his design for the open competition in 1885, which received the second premium, and then his drawings for the limited competition in 1891, which procured him the commission for the work.

The block plan indicates the relative positions of Blocks Nos. I., II., and III., and the general view shows how the group will be seen from the opposite bank of the River Aar. Another shows one side of the proposed grand staircase leading up to the level of the Council Chamber. The two plans reproduced are taken one on this floor, the other at street level.

On entering the building from the town the visitor, after passing some outer lobbies, reaches the main vestibule. On the one side of this hall there is a spacious porters' office. From the vestibule the grand staircase is reached, which is to be the feature of the building. Mounting it the visitor finds himself in some spacious corridors leading on the one side to the "Upper," on the other to the "Lower" Chamber. The Upper Chamber facing north has its own lobbies, cloak-room, small committee-room and a President's parlour. It has its small public and private galleries, which have separate approaches by way of two minor staircases off the first-mentioned outer lobbies. This Chamber is side-lighted. At the opposite side of the building, surrounded by its own spacious reading-room, two inner lobbies, cloak-rooms, small committee-room, and chairman's parlour is the large Council Chamber. This hall is top-lighted, measures 25 by 20 metres, or 82 ft. by 66 ft., and holds seats for some 180 members. The reading-room measures 131 ft. by 20 ft.; each of the inner lobbies, 39 ft. by 26 ft. There is again good gallery accommodation, the approach being by means of two separate public staircases. One of these is

also for the special use of the short-handlers who have a large room on this floor pendant to their room is the usher's. There is a connecting passage between the east and west of the block, with openings overlooking the grand staircase. This passage is the main communication between the existing Nos. I. and No. II., which are connected on this level with the proposed building's central corridors of Blocks No. I. and II. and line with the passage.

The second floor of the new block, which cut into by the upper part of the Council Chamber with their galleries, has only been reserved for committee-rooms, of which there are various dimensions.

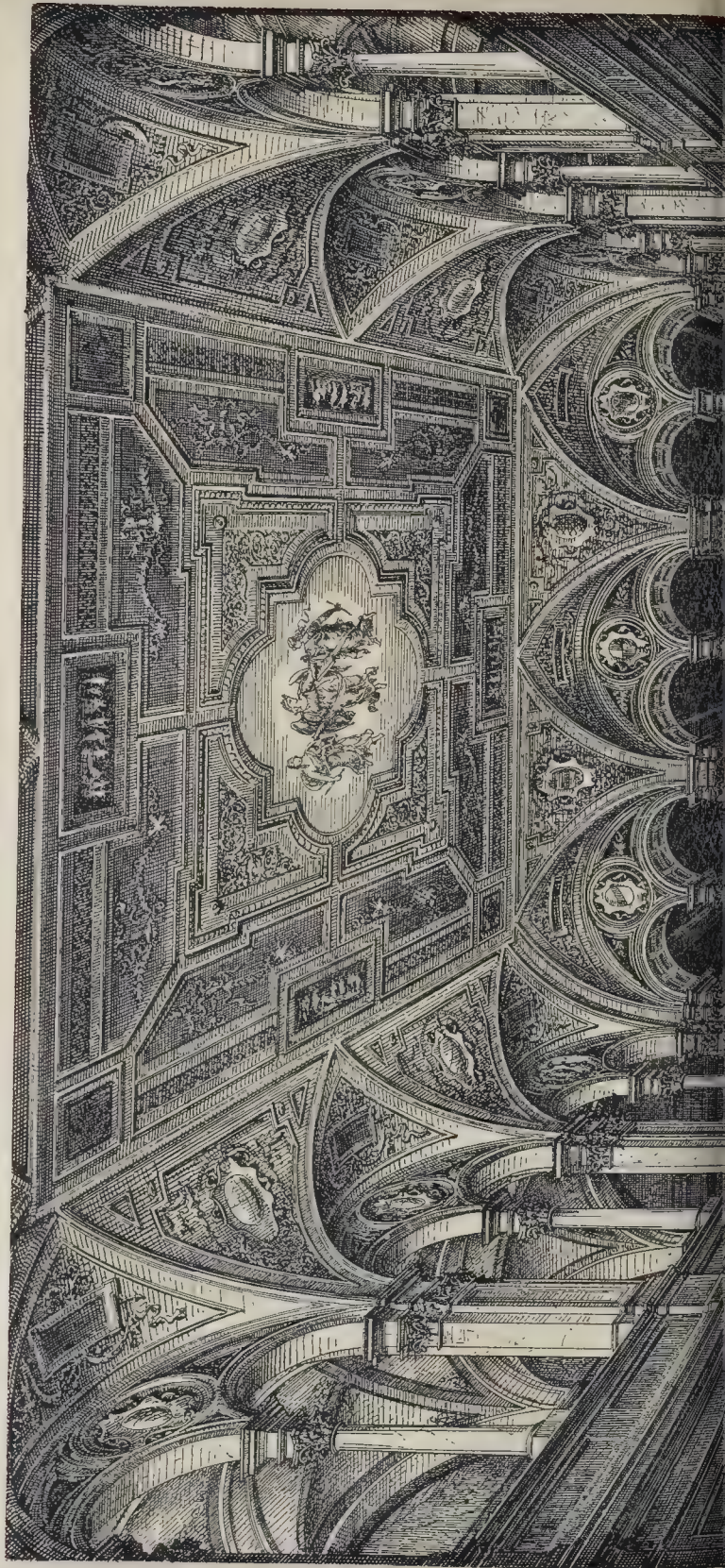
On the ground-floor level room has been on the south front for a small national committee room. There is also a library and a small refreshment room on this level. The Parliamentary Press have very ample offices on the east side of this floor, whilst the east has been taken up by the various offices and a tenement caretaker. Strange to say, there has appeared no necessity to find space for the telegraph, and police-offices usually found in Houses of Parliament, as in the case of the new "Reichstagshaus," at Berlin, of which we published some drawings in January; a little provision is made for the comfort of the individual member. The large reading-room on the first floor is practically his only luxury, and is, however, good lavatory and cloak-room accommodation throughout the block.

The elevations of the building, which to be carried out in a national sandstone designed in what the architect termed Renaissance style of the end of the 15th century—i.e., the period in which the Basle figures so prominently in the history of Switzerland. The interior is to be of a later date, and, as in the case of the

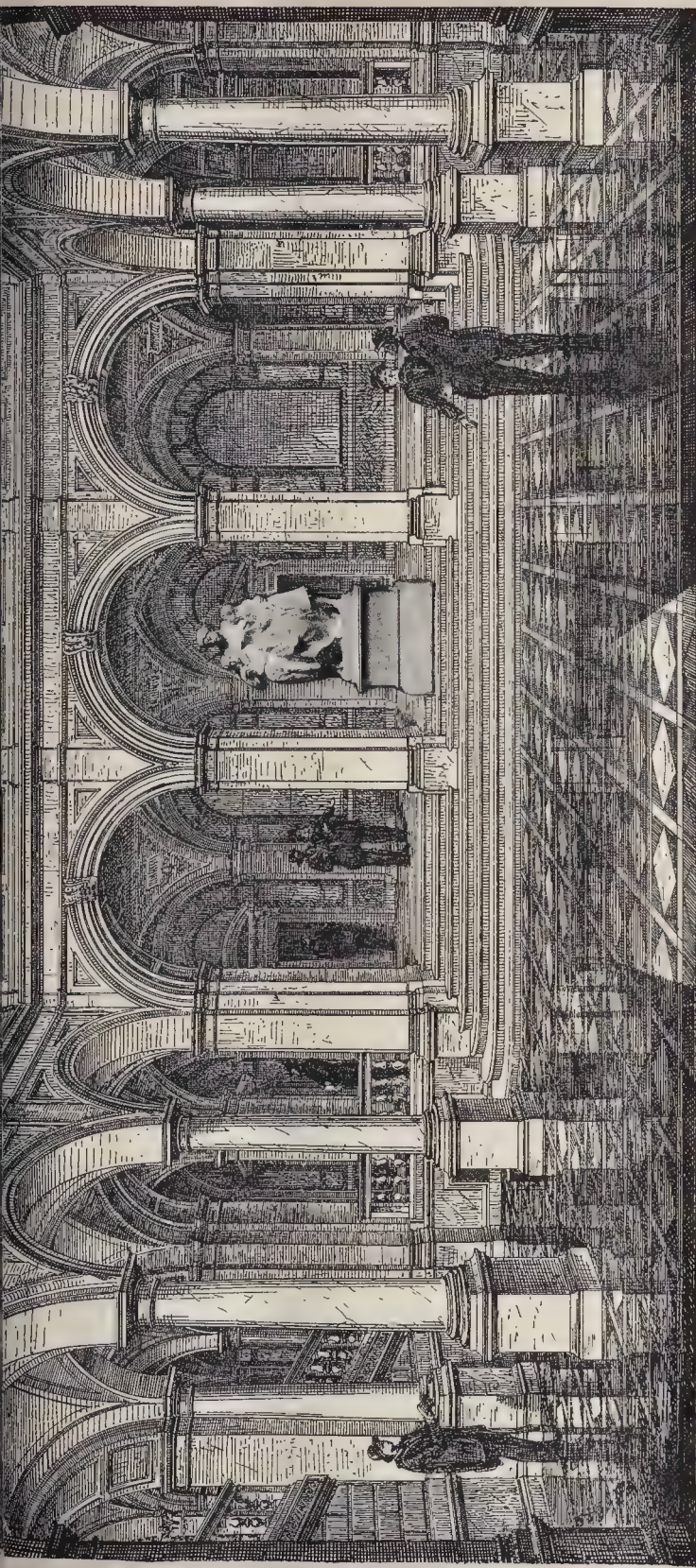




THE BUILDER, APRIL 28, 1894.



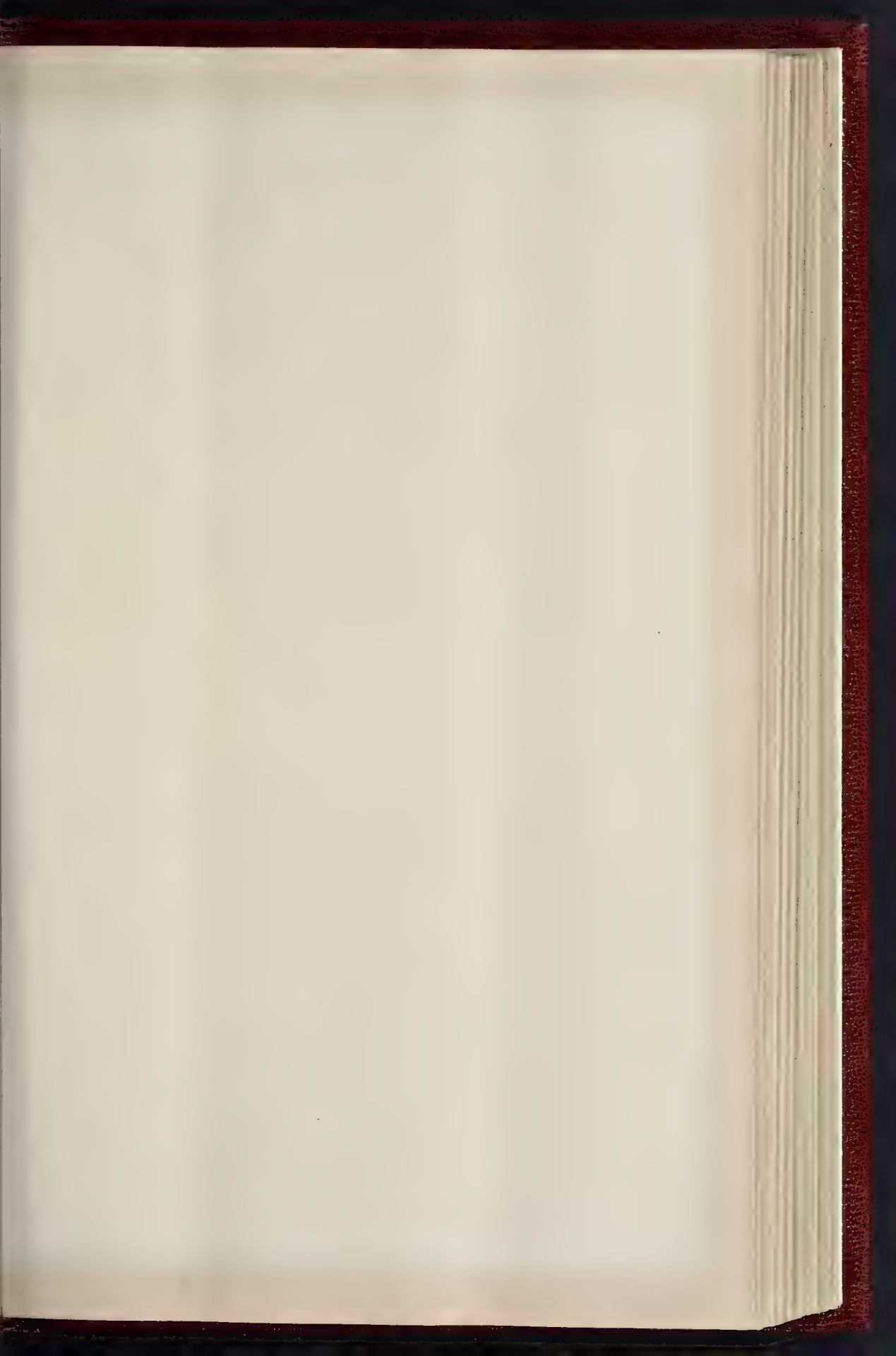




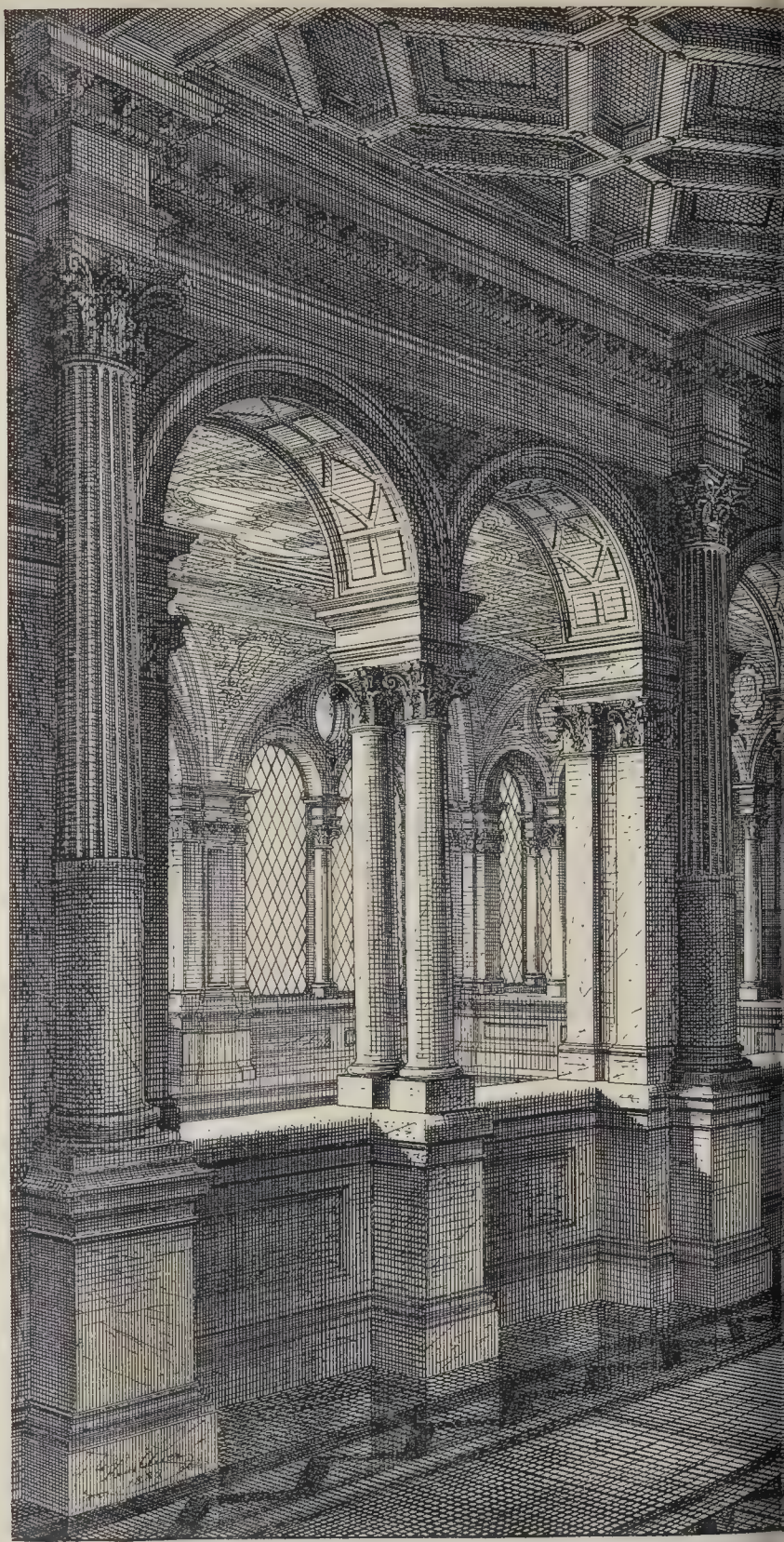
HOUSES OF PARLIAMENT, BERNE.  
THE VESTIBULE OF THE NEW GOVERNMENT OFFICES (BLOCK II, 1888-1892) — PROFESSOR H. AUFR. ARCHITECT.





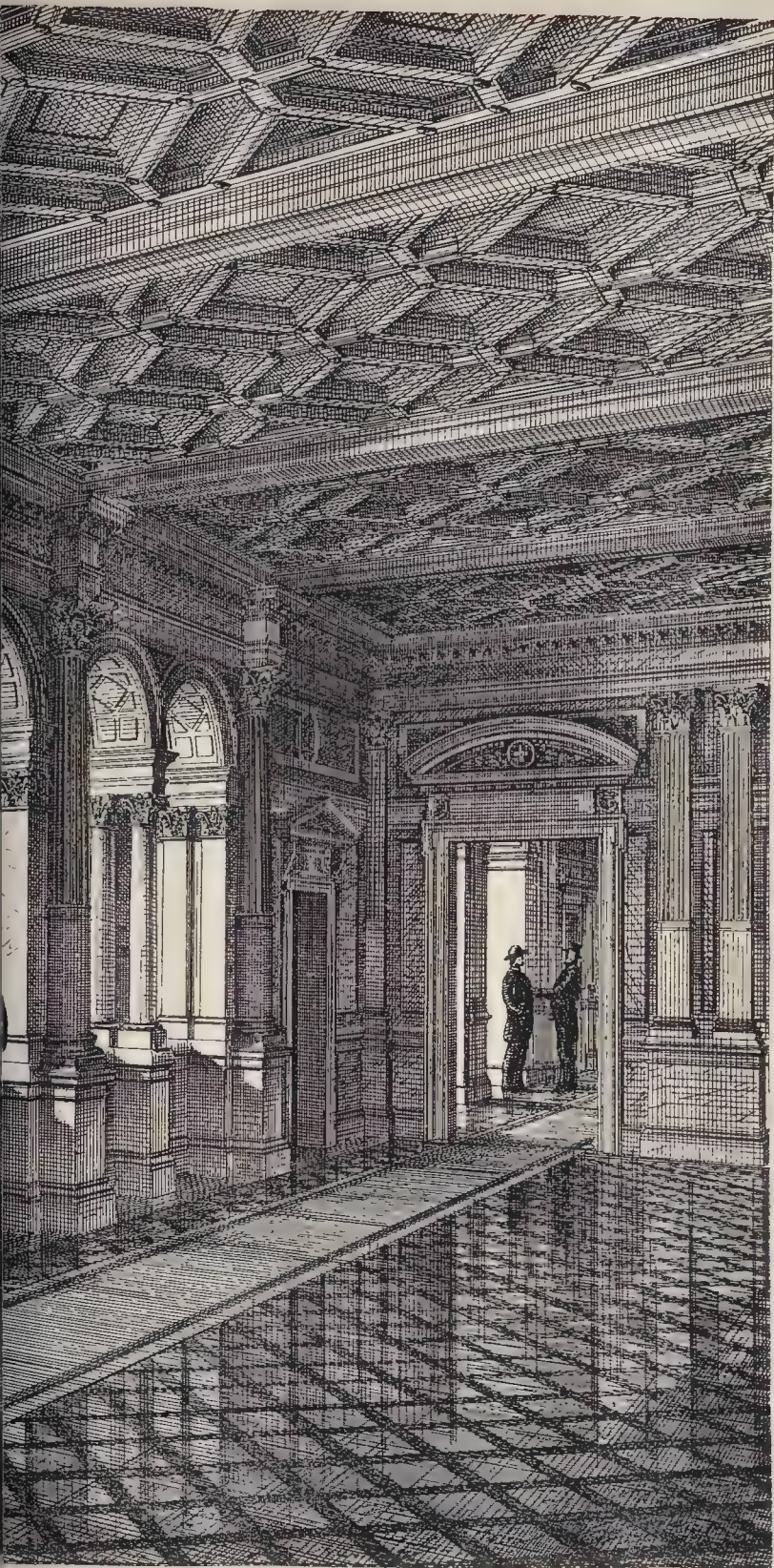






HOUSES OF  
THE FIRST FLOOR GALLERY OF THE NEW GOVERNMENT HOUSE

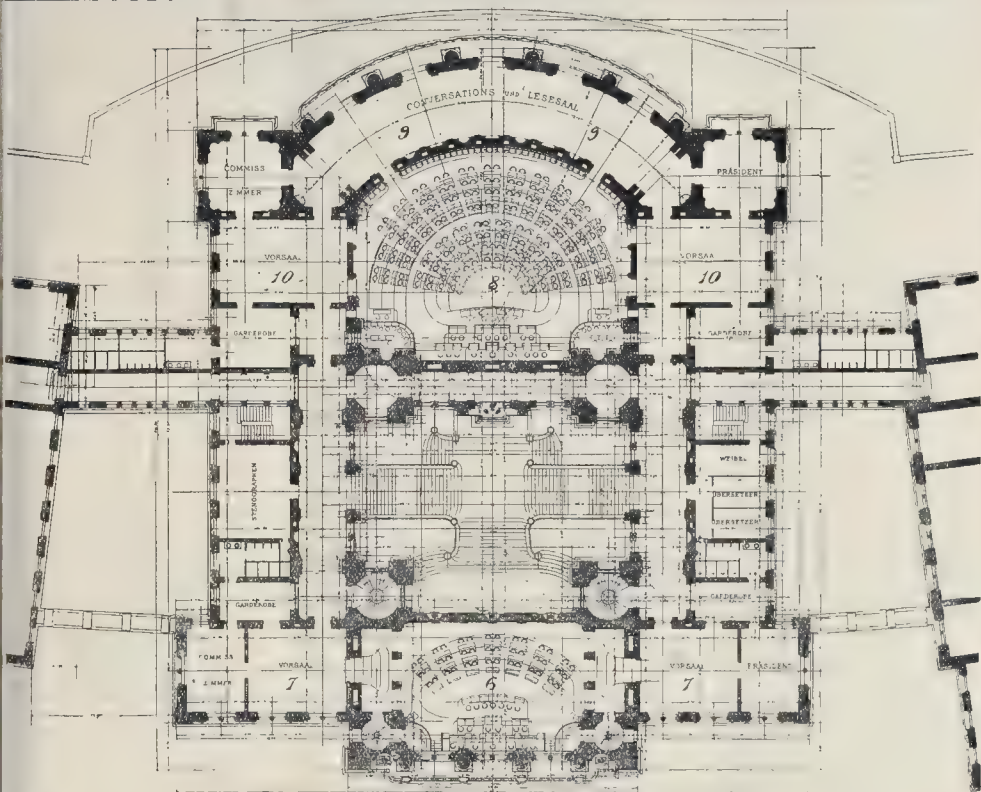




ERNE  
 LOCK II, 1888-1892).—PROFESSOR H. AUER, ARCHITECT







UPPER FLOOR.  
Bernese Houses of Parliament: Plan of proposed New Buildings—Block III.  
REFERENCES.

6. Small Council Chamber.

7. Lobbies.

8. Large Council Chamber.

9. Reading Room.

10. Lobbies.

ill, to a certain extent, depend on the colour-  
udy. The materials used will here again be  
ational ones; marble-work will be used a great  
eal, as also the woodcarving in which the Swiss  
re very proficient. A number of historical  
rescues are to play an important part in the  
appearance of the building.

Speaking of the cost, but little can at present be  
aid, but according to the architect's estimate the  
um of 5,000,000 francs need not be exceeded.  
Whatever the price may be, the Swiss can  
ertainly be proud of the fine *ensemble* their  
overnment is creating at their interesting  
pital. What with this new block, the new  
useum, its public offices and bridges, the Swiss  
pital will soon have a stately array of archi-  
tural monuments situated in about as fine  
osition as can be found.

Swinton stone. After a glance at the rural  
entrance lodge, and the approach, a move was  
made by the members of the Association for the  
house. The entrance-hall, panelled in oak, and  
with a billiard-table, first attracted attention, and  
then the drawing-room in the southern wing was  
visited. The windows of this room command the  
Quair valley. A visit to the library, with its  
oaken bookcases, was next followed by a survey  
of the dining-room. Retracing their steps to the  
hall, the party next ascended, by a fine oak stair-  
case, to the floor above, where various rooms  
were inspected. After inspection of the house,  
and the architectural features having been closely  
scanned, an ascent was made to the flagstaff tower,  
and subsequently the gardens were visited.

sidered. He then dealt with hot-water supplies,  
advocating the use of low-pressure arrangements  
or of high-pressure boilers with safety valves  
under proper inspection, so as to avoid the  
dangers of explosion. House sanitary arrange-  
ments were discussed from a waterworks point of  
view, and the author showed that, if properly  
utilised, the allowance of two gallons per flush  
for closets was sufficient."

CHRIST CHURCH, DUBLIN.—Some of our Irish  
readers take exception to our remark that Christ  
Church presented less of ancient interest than St.  
Patrick's; we should explain that the remark had  
special reference to the exterior, which is what we  
are illustrating. The view of St. Patrick's which we  
gave at the commencement of this month, included  
some unrestored work; that of Christ Church,  
which we shall give next week, is practically all  
Street's work, as far as exterior appearance goes;  
hence our remark, and our giving Christ Church the  
second place.

NEW PUBLIC GROUNDS FOR HARROGATE.—  
The Corporation of Harrogate a short time ago  
secured the property known as the Crescent Estate,  
with the object of securing a free public garden in  
close proximity to the wells and baths. A scheme  
for laying out the ground has already been placed  
before the Wells and Baths Committee by the  
Borough Engineer, Mr. S. Stead. The ground  
proposed to be dealt with is situate between the  
Spa, Victoria Baths, Swan-road, and Crescent-road,  
and is 600 ft. long by 220 ft. wide. The gardens  
are to be of an ornamental character, with a large  
central fountain, pump-room, shrubberies, grottoes,  
bandstand, &c., and provides, if thought desirable,  
for utilising the present Town Hall Theatre as a  
permanent museum or art gallery.

\* No doubt, "from a waterworks point of view."—Ed.

#### ARCHITECTURAL SOCIETIES.

ARCHITECTURAL ASSOCIATION SOIRÉE. We  
were asked to draw attention to an unavoidable  
change in the *locale* of the soirée on May 4.  
Through some misunderstanding the Westminster  
Hall, where the soirée was to have been  
held, is not available, and the entertainment will  
be placed at the Holborn Town Hall instead.

EDINBURGH ARCHITECTURAL ASSOCIATION.  
On the 21st inst. the Edinburgh Architectural  
Association visited Sir Charles Tennant's Peebles-  
hire residence, The Glen. The mansion is  
situated in the valley of the Quair, the nearest  
railway station being at Innerleithen. The major-  
ity of the present mansion house was erected in  
1541 from plans by the late Mr. David Bryce,  
chitect, Edinburgh, and eighteen years later it  
was enlarged from designs by Mr. John Bryce.  
It is a Scottish Baronial edifice, built with

#### ENGINEERING SOCIETIES.

LIVERPOOL ENGINEERING SOCIETY. At the  
meeting of this society held on the 18th inst.,  
Mr. Thomas Duncanson, Assoc. M. Inst. C.E.,  
read a paper entitled "Notes on the Distribu-  
tion of Water Supplies." The author first  
gave data as to the quantity of water required  
to be provided for the supply of a district  
and the variations in the rates at which it  
must be supplied, showing that the maximum  
rate at any hour during the year exceeds the  
average by about 85 per cent. He then spoke  
of iron distributing and service mains, the rules  
for determining their sizes and their rates of  
deterioration, the various classes of house service  
pipes and how to protect them from frost. Some  
experiments on service pipes were described,  
which showed that lead pipes likely to be exposed  
to the effects of frost should be made of greater  
strength than was necessary if only the hydraulic  
pressure to which they were subject was con-



## THE LONDON COUNTY COUNCIL.

The usual weekly meeting of the London County Council was held on Tuesday in the County Hall, Spring-gardens, Mr. John Hutton, Chairman, presiding.

*Flat S. 9 (Caledonian-road, branch).* The Main Drainage Committee reported that on December 19 last the Council approved of the deepening of a portion of the Caledonian-road branch of the Fleet sewer at the then roughly estimated cost of 3,600*l.*, and instructed the engineer to prepare plans, specification and estimate. These have now been completed. The total length of the new sewer will be 1,417 ft., extending from Charlotte-street to Bingfield-street, and the cost of the work after measurement is estimated at 6,750*l.* The Committee recommended:—

"That, subject to an estimate being submitted to the Council by the Finance Committee as required by the statute, the work be carried out by the Council without the intervention of a contractor, and that the plans, specification, and estimate be referred to the Works Committee for that purpose."

The recommendation was agreed to.

*Plan of District Surveyorship.* The report of the Building Act Committee contained the following paragraph, the recommendation being agreed to:—

"The Council on March 13, 1894, referred back to us a recommendation which we then submitted with regard to the appointment of a district surveyor for the district of St. Pancras North and the detached portion of Clerkenwell. The gross amount of fees yielded by the district has averaged during the years 1890-92 100*l.* per annum. This amount is so much below that contemplated in standing order 189 that we do not at present see our way to recommend the appointment of a district surveyor under the new conditions for the vacant district. We therefore submit the following recommendation:—

"That, until some permanent arrangement is made by the Council, Mr. Grose, District Surveyor for St. Pancras East, be appointed temporary District Surveyor for so much of the vacant district of St. Pancras North as lies south of the Tottenham and Hampstead Junction Railway, and that Mr. Hanbury, District Surveyor for Northwood Islington, be appointed temporary District Surveyor for the remaining portion of St. Pancras North and the detached portion of Clerkenwell."

*Enlargement of Clerkenwell Fire Station.*—On the recommendation of the Fire Brigade Committee it was decided to enlarge and alter the Clerkenwell Fire-Engine Station, the work to be done by the Council, and without the intervention of a contractor.

*Electric Lighting Installation for the Victoria Embankment.*—The Highways Committee reported as follows in reference to this question:—

"The Council on April 10 instructed us to consider the advisableness of widening the footways of the Victoria Embankment by taking in a few feet of the carriageway on each side, in order to allow the electric light standards to be placed on the sides of the carriageway without interfering with the trees. With reference to this suggestion we would point out that the footways are of great width, 20 ft. on the river side and 16 ft. on the other, and in order that the lamp standards might be clear of the trees the width of each of the footways would have to be increased by 8 ft., and that of the carriageway correspondingly reduced from 6½ ft. to 48 ft. Having regard to all the circumstances, we are of opinion that it is not advisable that the course indicated in the reference should be adopted. We understand that the Parks Committee has now under consideration a suggestion that some of the trees should be removed to facilitate the proper growth of the remainder; and we think it advisable that, until some decision shall have been come to upon this suggestion, the further consideration of the question of the positions to be occupied by the lamp standards should be deferred."

*The River Thames.*—The Main Drainage Committee's report contained the following paragraph, the recommendation being agreed to:—

"We have to report that the systematic examination of the water of the river Thames between Teddington and the Nore, which was undertaken under the authority of the Council, was continued until the 21st of March. As the examination was commenced during a period of drought when the sea water in the river was at its highest, and as the value of the work would be largely enhanced by following the decrease of sea-water until the minimum was reached, we considered it desirable, after conference with the engineer and chemist, to have the analysis of the water continued until the evidences of the presence of sea water were reduced to a point which experience had shown to be the lowest, and thus obtain information as to the state of the river under both extremes of condition. The total expenditure thus incurred in collecting and analysing samples, beyond the sum already authorised by the Council, together with the wages of an assistant until about the end of June in tabulating the results, amounts to nearly 250*l.* We recommend:—

"That, subject to an estimate being submitted to the Council by the Finance Committee as required by the statute, the work be carried out by the Council without the intervention of a contractor, and that the plans, specification, and estimate be referred to the Works Committee for that purpose."

*London Streets and Buildings Bill.*—The Parliamentary Committee brought up a report, one of the paragraphs of which related to the London Streets and Buildings Bill. It was as follows:—

"We have received from the Joint Sub-Committee of this Committee and the Building Act Committee, suggestions for amendment of Clause 175 in the London Streets and Buildings Bill relating to the storing of wood and timber. The amendments affect paragraphs 3 and 5 of the clause which in the Bill as approved by the Council are as follows:—(3.) All yards in which timber, lathwood, firewood, casks, or barrels are stacked within 20 ft. of the public way shall be separated from the public way by brick walls not less than 9 ft. in height with the exception of the necessary gates, and no timber, lathwood, firewood, casks, or barrels shall be stacked upon or so as to project over such walls. (5.) No part of any pile, stack, or store of timber, lathwood, firewood, casks, or barrels shall be within 10 ft. of the top of any chimney, and if such pile, stack, or store exceed the height of the chimney, the height above the chimney-top shall not be greater than the horizontal distance of the face of such pile, stack, or store from the top of the chimney. The sub-committee proposed the insertion in paragraph 3, after the words "public way" in line two, of the words "and within fifty feet of any building on the further side thereof," and they also proposed to omit all words in paragraph 5 after the word "chimney" in line two. We have carefully considered the matter, and are of opinion that it would be better to omit the paragraphs altogether if by so doing objection may be avoided. We have accordingly instructed the agent to intimate to the parties who have petitioned against the clause that on their giving an undertaking to withdraw their opposition the Council will be prepared to withdraw the paragraphs in question. We recommend:—

"That the course taken by us in so instructing the agent be approved."

Mr. W. Crooks asked what had become of the clause in the new building act in reference to non-combustible signboards.

Dr. Longstaff replied that the clause had been withdrawn.

Mr. Beachcroft said he considered the report most unsatisfactory. Were they to understand that, in order to avoid opposition, the Council were going to withdraw important paragraphs from the Bill? Surely it would be better, if the sub-committee had carefully considered the matter, to admit some amendments rather than withdraw the whole paragraph or clause, so that opposition might be avoided altogether. He, therefore, moved "That, in the opinion of the Council, paragraphs 3 and 5 of Clause 175 in the London Streets and Buildings Bill, relating to the storing of wood and timber, should not be withdrawn, but that the amendments proposed by the Joint Sub-committee should be agreed to."

Mr. Yates seconded the amendment, which, after a short discussion, was agreed to, twenty-nine voting for it and twenty against.

*The Water Question.*—The Water Committee stated that at the meeting of the Council on March 20 they reported the substance of the answers which they had received from the Grand Junction, the East London, and the Southwark and Vauxhall water companies to their letter communicating the resolution passed by the Council on February 27 with regard to entering into negotiations for the purchase of the companies' undertakings. The committee had since received the following further replies.—From the Chelsea Waterworks Company stating that the directors would be averse to the transfer of their undertaking, but that, if the Council should think fit to make them any definite proposal, they would give it their most careful consideration; the Kent Waterworks Company, stating that the directors, while unable wholly to adopt the bases submitted, and having no reason to desire to part with their property, would give their best consideration to any fair and reasonable proposals the Council might submit to them, but that they deemed it premature to enter upon negotiations for the sale of the company's undertaking by agreement until the Council or some authority has been empowered to make and carry such agreements into effect, and until the questions relating to the subsequent administration of the water supply in the company's large extra-metropolitan area have also been settled; the Lambeth Waterworks Company, stating that the directors had no power to enter into a binding contract for the sale of the undertaking, and therefore consider it undesirable and inexpedient to enter upon negotiations for the transfer thereof; the New River Company, stating that, while the company

were unwilling to sell their undertaking, they were prepared to give full and careful consideration to any communication which the Council might desire to make, but that the directors must distinctly intimate that the conditions laid down in the resolution of the Council could not be accepted by them as the basis of negotiation; and from the West Middlesex Company, stating that, although the company were unwilling to sell their undertaking, the directors would not fail carefully to consider any definite proposal that the Council might think fit to make to them on the subject. All the companies having now answered the communication, the committee were considering as to the further steps to be taken to give effect to the Council's resolutions.

The Council adjourned shortly after seven o'clock.

## Correspondence.

To the Editor of THE BUILDER.

## CHURCH OF ST. JOHN, DAMASCUS.

SIR,—I am afraid I misunderstood Mr. Lethaby's reference to the clearstory windows on the east and west sides of transept. On the west side, according to a drawing in "Picturesque Palestine," they are only partially blocked out by roofs which (to judge by the pitch and external lead covering) were raised at the same time as those over the transepts, probably in the sixteenth century. In their original condition they left the windows quite free, and their arrangement suggested the probability of an earlier building on the west side, viz., Arcadius' church.

The columns of the north front of north transept and of the arcades of the eastern nave have lofty dosserets or impost blocks above the capitals, which are of the same proportion and style as those of the arcade round the great northern court, which, we know, was built, together with its great enclosure wall, by Walid in 705; and, therefore, I attributed them to the same period. My own drawing, published February 17, shows no dosserets, and I have no view from which to decide whether there are any in the west wing. Mr. Lethaby assumes that the great court on the north side existed as such in Arcadius' time, but there is no proof of this, and as we know that Walid enclosed this court with a wall and built the arcade, he probably cleared the space for that purpose. The arcade is possibly built on the lines of the enclosure of the temenos of the Roman temple, but this same enclosure can still be traced on the south side, which was left undisturbed by Walid. It is for this reason that I am quite unable to accept Mr. Lethaby's arguments relative to the placing of Arcadius' church in a court which at that time may not have existed. The church having been built between the Roman temple (of which three doorways still exist) and an ancient structure, possibly a tower at the south-west end, I can see no difficulty in building the east side of the church so that the eastern wing should correspond exactly in dimensions with that already existing at the west end; leaving a space in the centre and in the axis of the great court enclosed by Walid on which the latter erected the transept as we now find it. In fact, the peculiar planning of the transept piers with the arches they carry, almost prove that there was some reason why, at their base, they did not form a square on plan.

The rebuilding of the north wall of the western aisle, and its being thrown open to Walid's court through arches carried on columns, is in accordance with the custom observed in all mosques such as is found in that of Amer at old Cairo; El Aksak, Cairo; of Cordova in Spain, of Kerouan in Barbary, and of numerous other well-known examples. Here in Damascus, however, as in Jerusalem, the climate was found to be too cold in the winter to allow of it, and therefore the columns were encased in masonry and doors added. I still adhere to my contention that in Arcadius' time the workmen were not capable of throwing arches of the span of 45 ft. Mr. Lethaby cannot see any difficulty in constructing a dome of such dimensions at any time between the building of the Pantheon at Rome and the Sophia at Constantinople. Why, then, was Constantine, who ultimately completed the great vault of the Temple of Peace at Rome, so helpless when he removed the Empire to Byzantium, that he was actually incapable of building any structures but of the most ephemeral kind, so poor in construction that, even in Justinian's time, they were either in ruins or had to be taken down and rebuilt? My dimensions of Bethlehem were taken



The main portion of my remarks had reference to the great superiority of this system of Propulsion



over any method of Extraction, particularly for hospital use, because an even temperature and humidity, as well as definite and frequent change of air is thereby secured, without setting up dangerous draughts, and because the pressure of the air in the wards, being always in an outward direction, that from contaminated sources cannot enter.

The distinction between the two systems is of so much importance that I shall be obliged if you will give the explanation equal prominence in your paper.

WILLIAM HENMAN.

P.S.—The paper will appear in the next issue of the "Transactions" of the R.I.B.A.

\* \* \* We may point out to Mr. Henman that we do not require any one to tell us the distinction between the plenum and the vacuum system is an important one. We agree with his view that the plenum system is generally preferable, for various reasons, one being that the choice of the stratum from which the internal air shall be replenished is more under control than it can be with the vacuum system. Mr. Henman is mistaken in supposing that the misrepresentation of what he really said is due to any one on the editorial staff of this journal. If the Leeds and Yorkshire Society sent us, as some other country societies do, an authoritative report as to the substance of papers read at their meetings, the mistake probably would not have occurred.—Ed.

#### ADMIRALTY BUILDINGS HEATING AND VENTILATING CONTRACT.

SIR,—I desire, with your permission, to reply to the letter in your issue of the 24th inst., under the heading of "Admiralty Extension: Building, Heating, and Ventilating Contract," signed "John Jeffreys."

In the first place, Mr. Jeffreys states his men were interfered with by the London Building Trades Union officials, on the pretext that they were working more than nine hours per day, but really because they did not belong to the union.

This statement I absolutely deny. The officials, as he terms them, saw his foreman, and accompanied him to the office, and saw Mr. Jeffreys, but did not see any of the workmen, except the foreman mentioned above.

Secondly, Mr. Jeffreys gives the rates of wages for skilled fitters, but he does not state what he pays the fitters he employs. I deny that he pays 6d. to 10d. per hour for fitters; and in his anxiety to run into the Press, he did not trouble to inform himself of the fact that 6d., and not 6d., per hour is the rate of wages for labourers. No doubt he pays the latter amount, additional evidence which goes to prove the case against himself.

The men start work at 7 a.m. and leave at 5 p.m., and are paid ten hours for it, no deduction for dinner hour, but I wish to remind Mr. Jeffreys he does not state the time the men have to be at his shop in the morning.

Finally, I may state those delegates that interviewed Mr. Jeffreys attended solely on the question of hours and nothing else, and if they had been as thin-skinned as Mr. Jeffreys I have not the least doubt but they would have retaliated pretty smartly to the insulting language used by him. The majority of the employers in London have expressed themselves favourable to an interview when questions of this nature arise, and which experience has proved is the better way of arriving at a satisfactory arrangement without friction on the jobs, but I suppose Mr. Jeffreys would consider it a reproach on his name to admit that workmen have a right to see him on a question in which they claim to have a right to speak.

J. VERDON, Secretary,  
London Building Trades Federation.

#### IS A CONCRETE FLOOR SOUND-PROOF?

SIR,—Filling up the space between the concrete and the floor boards with silicate cotton, dry sawdust, or some other good non-conductor, and nailing strips of thick hair felt on the edges of the joists before relaying the floor boards, would very much lessen the transmission of sound. It seems strange that, although the use of concrete—more especially for floors—is becoming common, its capacity for conveying sound is so misunderstood as to render it necessary to ask in the *Builder*, "Is a concrete floor sound-proof?" As a matter of fact, the better the concrete the more readily it conveys sound. An actual trial lately proved that ordinary conversation could be distinctly heard through a 6-in. concrete wall plastered on both sides, and the same applies to concrete floors.

Concrete floors should never be constructed solid throughout if required to be sound-proof, and where wood, in the form of joists, bears directly on the concrete, sound is very readily transmitted from one to the other.

THOMAS POTTER.

#### "BOILER EXPLOSIONS."

SIR,—Although endorsed by your editorial footnote, my letter (page 241) has failed in its purpose of eliciting detailed particulars of hot-water supplies where accidents have occurred owing to frost. Mr.

Buchan has, perhaps, helped to confuse the matter by dilating upon the acknowledged advantages of the low-level system, and so ardent an advocate is he that he appears blind to the "secondary return" introduced to obviate an original drawback to the system—viz., a pipe full of water to be emptied before you get to the hot.

It was no theory when I stated that water expanded with cold (and, therefore, circulates with cold of below 39 deg.), and freezes from the top downwards: both are elementary truths.

The expansion-pipe carried through the roof is, in my opinion, the prime offender. One case has come to my knowledge since writing. It is, however, an aggravated one, for the water always stood in the expansion-pipe above the slates, there was the constant supply, and the low-level system. The hot-water pipe burst (not the boiler) immediately above the cylinder.

FRANCIS E. JONES.

#### LONDON TRAMWAYS CO.

SIR—in your "Note" on the recent decision, you quote the words of the disputed clause in the Act as "them their value ('exclusive of,' &c., &c.)."

The *Times* report gives these words as "the then value," and it is, I think, the word "then" which has caused some doubt as to the exact meaning of the Act. I agree with you there can be little difference of opinion as to its intention.

R. LANGTON COLE.

### The Student's Column.

#### THE STRUCTURE AND PHYSICAL PROPERTIES OF BUILDING STONES.—XVII.

##### 4. THE HAM HILL DISTRICT.

NUMBER of small oolite quarries, mostly worked for road-metal and lime, are to be seen in the vicinity of Yeovil and Sherborne, and although our notes on the area are somewhat extensive we do not purpose to describe them in this connexion, as very little of the material is true "building stone," as distinguished from odd-course stone, walling, &c.

An exception must be made, however, for the quarries on Ham Hill, near Montacute, in Somerset, where the Inferior Oolite is very actively exploited in several large quarries, which give employment to about 200 men. Judging from the buildings in the vicinity and from the enormous heaps of debris, conspicuous for miles around, the material must have been worked for centuries. The following geological sketch map (fig. 25) serves to indicate the site and to explain

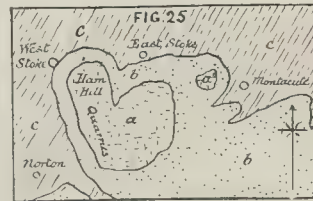


FIG. 25.—Geological Sketch Map of Ham Hill.  
a=Inferior Oolite. b=Midford Sands. c=Marlstone-Lias.

the geology of the locality. The quarries are situated at the very summit of the hill, and are all open workings. The face of one of them is 80 ft. in height, 40 ft. of which is overburden, having to be removed before the lower 40 ft. containing the good stone can be taken out. Very few quarries in the country give a sufficient depth of good stone to warrant the expenditure of money for the removal of as much as 40 ft. of rubbish over it. The building stone consists of beds of variable thickness, ranging from 6 in. to 2 ft. 6 in. on the flat; as a rule, the thickest beds are situated at the bottom of the quarries. The vertical joints are irregular, but far apart, and stone of practically any length can thus be obtained. The average thickness of blocks is about 1 ft. 6 in.

Ham Hill stone varies in tint from light yellow (called "white") to light orange, and much of it is streaked with these colours, producing the phenomenon of "false bedding." The best stone for cornices, projections, and all weather-courses is stated to be the "grey" bed at the bottom of the quarries. Rock powder is never used except for blasting the overburden. The stone is not quarried as a rule in winter, as it is found to scale with frost—as, indeed, do many other freestones. It is raised to the bank by large steam cranes, and being placed on trolleys is then run

on lines to the steam saws and large sheds. The men who lift the stone from the first place (the "getters") are paid work; but other quarries, and those "rid" the overburden, are on piecework. Trade is mainly in dressed stone.

#### Micro-Structure of Ham Hill Stone.

Very little need be said respecting this, have already described and illustrated a section of the stone when dealing with structure (see ante, p. 221; plate, fig. 3) may, however, remind the student that it is essentially of shelly matter bound together by crystalline granular calcite, and that it is free, open spaces. It differs in structure from any other building stone with which we are acquainted.

Our experiments on certain physical properties of Ham Hill stone will be referred to in connection with the next district to be described.

#### 5. THE DOULTING DISTRICT.

In the vicinity of Doulting, near St. Mallet, the Inferior Oolite is much worked, employment to about 150 men, including many of the local population. All the quarries are open works, and the important are situated near the village of Chelnych. The following geological sketch map (fig. 26) indicates the sites of the various



FIG. 26.—Geological Sketch Map of Doulting District.

a=Fuller's Earth. b=Inferior Oolite. c=Midford Sands. d=Lias Clay. e=Carboniferous Limestone. f=Triassic Shale. g=Old Red Sandstone.

ings. Arrived at Doulting, we walk northward and observe the

#### Section at Chelnych Quarry.

Rubble, overburden, ..... 8 ft. to 10 ft.  
Upper freestone, fine grained, in two beds, ..... 2 ft. 6 in. and  
Lower freestone, coarser grained, in two beds, ..... 2 ft. 6 in. and

The vertical joints in this quarry are irregular, but far enough apart to yield stones. Blocks 5 ft. on the bed can so be procured. Minute ferruginous cracks on the stone in certain parts of the quarry material is cut in situ by lines of holes, picked, into which wedges are driven, and stone splits asunder. It is of a light brown tint. A short distance from this is the old quarry of St. Andrew's, whence the stone used in the construction of Glastonbury Abbey and Cathedral is said to have been obtained, now overgrown with trees, but we should be interested to obtain and test a sample of the material to ascertain whether it differs in any way from the Chelnych stone as at present seen below. Our observations on this point are given below. There is also another quarry plotted near by.

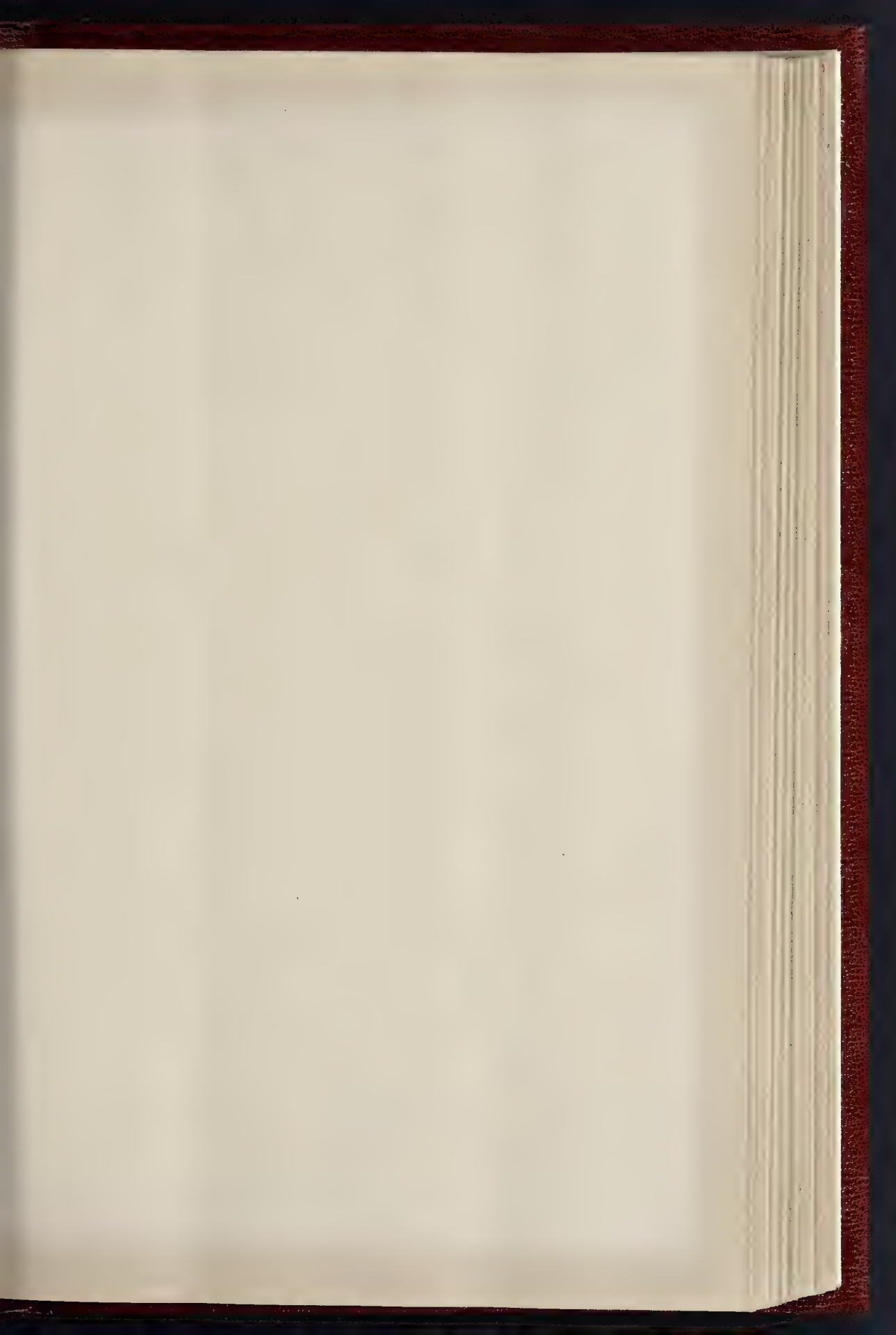
A mile due south brings us to the Brambleditch quarry, which gave the following section

#### Section at Brambleditch Quarry.

Rubble, rag, &c. (overburden) 24 ft. thick.  
Building stone in beds of variable thickness up of four beds—4 ft. 6 in., 3 ft., 2 ft., and 1 ft. respectively.

The "Brambleditch" stone is also of a tint, but is softer than the Chelnych. It is opening, and the stone is raised by means of a steam-crane—the only one in the district.

Another quarry in this stone, near the masons' sheds, but of lesser importance, the opening last alluded to, gave rubble of burden 10 ft., and building stone (inferior quality) 12 ft., in beds from 1 to 2 ft. in thickness. There is also a







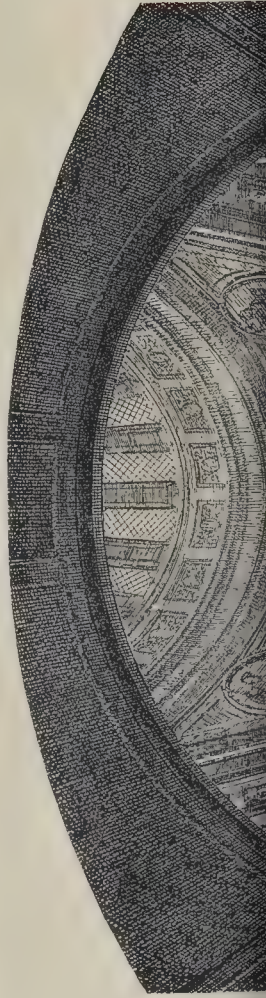
THE BUILDER, APRIL 28, 1894.

Block I. (1885-87)  
(MESSRS. STUBBS & STUBBS, ARCHTTS.)

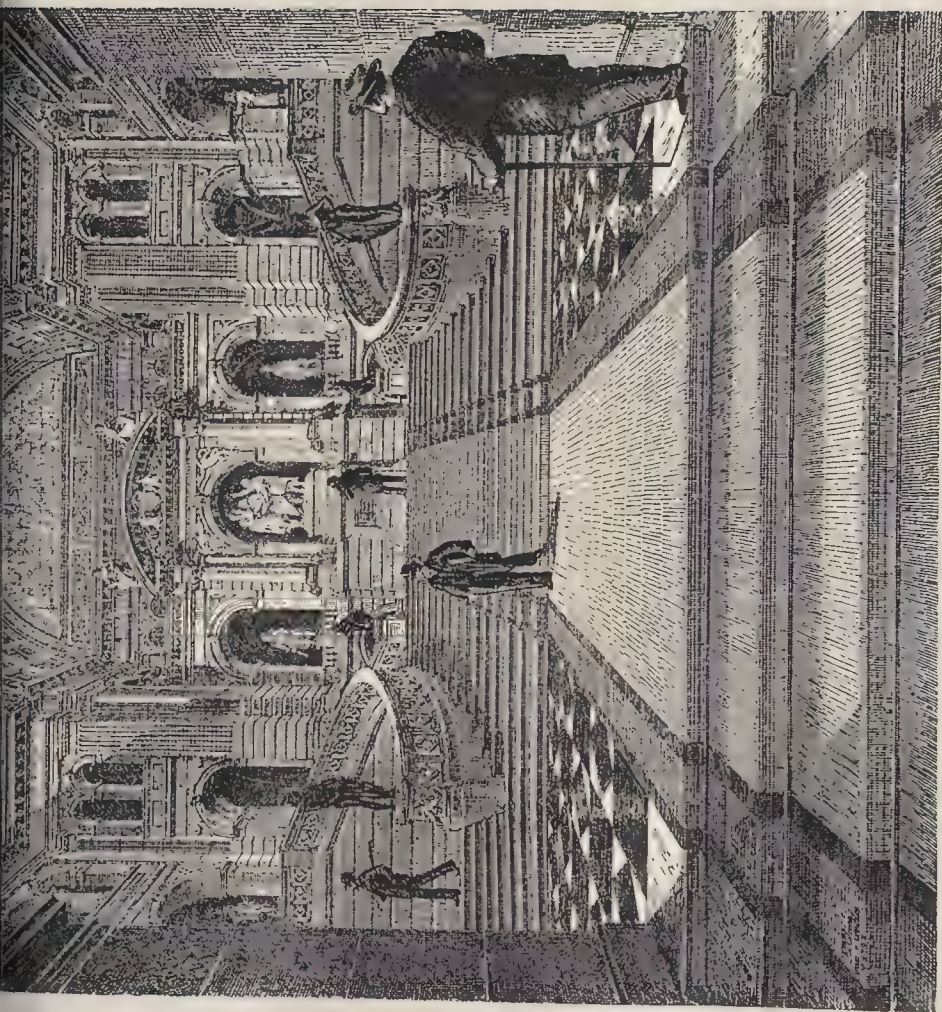
Block II. (Proposed)  
(PROFESSOR ALAN R. WILKINSON)

Block III. (1888-92)  
(PROFESSOR ALAN R. WILKINSON)

VIEW FROM THE SOUTH, SHEWING THE EXISTING BLOCKS WITH THE PROPOSED BUILDING IN THE CENTRE.







THE GRAND STAIRCASE.

THE PROPOSED HOUSES OF PARLIAMENT AT BERNE.—PROFESSOR H. AUER, ARCHITECT

Phot. M. G. & Co.





West Cranmore, practically unworked at the time of our visit. It may be mentioned that the Chelynch stone sent by horse-tram to the masons' sheds, a distance of about a mile, which latter are conveniently situated alongside the railway. The stone is largely converted by steam power.

Micro-Structure of Douling Stone.

The micro-structure of this stone, from both Chelynch and Brambleditch quarries was described and illustrated ante, p. 221, plate, figs 4 and 7, but the following additional observations may be useful. Brambleditch.—Made almost entirely of fragments of shells, crinoids, &c., bound together in a matrix by a rather imperfect calcitic matrix. Here and there quartz grains are seen; and granulated silica is developed as a partial matrix, but the amount is small. The stone is very open, free faces being exceedingly abundant. Many of the organic remains are partially decomposed, but by becoming absorbed to a certain extent in the crystalline matrix, the stone suffers but very little in consequence.

Chelynch.—This differs primarily from the Brambleditch in the comparatively fresher appearance of its organic remains, in the more undulant matrix, in the relative rarity of free argillaceous grains, and in not being so open. Moreover, some of the echinoderm remains are distinctly silicified, and more silica is disseminated in the matrix. The component particles considerably interlock with each other.

St. Andrew's Old Quarry.—Structure essentially similar to that just described from Chelynch, but these important differences, viz., free spaces are not so abundant, the matrix is beautifully crystalline, composed of remarkably well-formed calcite and in places of granulated silica. The cleavage planes in the calcite are very clear, and revolving the polariscope the lamellae exhibit fine display of colour. We have never seen a matrix of this character in any other Jurassic building stone; it must aid very materially in preserving the stone from decay.

The adjoining table shows the results of our experiments:—

pare the results on the two Brambleditch stones; during the one-second and one-minute immersions. That from the "small quarry" (near the works) rapidly shot ahead of its neighbour, but slackened speed during the half-hour trial, and fell short altogether before the end of the week's immersion. This is by no means an isolated example, for we find that given two similar building-stones, both absorbing the same amount at the end of a week, one will take up almost its full quantity in less than a minute, whilst the other requires a day at least to absorb half the total amount. The practical application of this fact is sufficiently obvious, and would be a prime factor in choosing between the two materials.

The most astonishing of our results, however, is the divergence in regard to specific gravity and absorption exhibited by the two Chelynch stones. It will be remembered that that marked "old quarry"—from which notable buildings that have stood the test of time remarkably well have been supplied—came from a working only a few yards distant from the new Chelynch quarries, and on the same horizon. Yet we see that it absorbed much less than the recently-raised stone. Such a result led us to institute a very detailed comparison between the two stones under the microscope; as we have seen, the old stone from St. Andrew's quarry has a more perfect matrix, which is very crystalline, and not as open as the new Chelynch, whilst it is more siliceous. Indications were present which led us to the conclusion that a slight change has also been induced, probably by the action of weathering in the old stone, and that the material already very durable—is rendered even more weatherproof on exposure. There is no doubt that the new Chelynch will behave in a similar manner. On scientific grounds, therefore, we regard the finer-grained Chelynch stone as a very good building material—one of the best of its class; the coarser-grained stone is also far above the average; but we are not so favourably impressed with any of the Brambleditch stones examined either in the laboratory or in the quarries.

Experiments on some Physical Properties of Ham Hill and Douling Stones.

	Ham Hill.	Brambleditch.		Chelynch.	
	Large Quarry.	Large Quarry.	Small Quarry.	New Quarry "fine bed." (St. Andrew's)	Old Quarry
Specific gravity .....	2.11	2.00	2.05	2.17	2.15
" " of particles .....	2.50	2.57	2.54	2.56	2.05
Water percent.	In 1 second .....	2.13	2.11	2.59	2.17
	In 1 minute .....	3.47	6.23	6.58	5.30
	In 30 minutes .....	6.30	8.85	8.14	5.83
	In 1 day .....	0.52	9.05	8.76	6.36
	In 1 week .....	7.17	11.06	9.39	6.89

Comparing the micro-structure of the Douling stones as a whole with those from other districts may at once be observed that the great preponderance of punctured organic remains (for the most part of echinoderms), and the peculiar pattern in which these frequently shade off into the crystals of the matrix, serve to distinguish these freestones from all others.

The structure of Ham Hill stone, differing so much as it does from that of the other two, must not be compared with them physically. It may be noted that for a stone with such fine grain, the Ham Hill absorbs but a small quantity of water, a circumstance no doubt due to its crystalline nature, which is such that its comparatively large holes are completely surrounded by practically non-porous substance; if otherwise its degree of porosity would be much higher.

The results show that the Brambleditch stone absorbs a greater proportion of water than the Chelynch, and its specific gravity is lower. The Douling stones, as a whole, do not absorb water so rapidly as do those from some other districts; but an exception must be made for that from the new Chelynch quarries where the bulk of this stone is now raised, which became almost thoroughly saturated in one minute. At the same time it may be mentioned that the total amount absorbed by this Chelynch one is in itself very little in comparison with that by some raised in the Tisbury and Portland districts, and by the generality of the Bath stones, as we shall see later on. It is interesting to com-

MR. GEORGE BURT.—Mr. George Burt, J.P., head of the firm of Messrs. Mowlem, Burt, & Co., the well-known contractors, of Grosvenor Wharf, Millbank, died suddenly of heart disease at his residence, Purbeck House, Swanage, on the 18th inst., in his seventy-ninth year. The deceased gentleman served the office of sheriff of London and Middlesex in 1878, and was a magistrate for London, Westminster, Middlesex, and Dorset. He was also one of her Majesty's lieutenants for the City, and a member and past master of several of the livery guilds.

ALDERMAN J. SESSIONS.—On the 16th inst. the death occurred at his residence, Park-road, Gloucester, of Alderman Jesse Sessions, stone and building-material merchant. The deceased was born in 1804 at Charlbury, Oxfordshire, and as early as 1820 he went to live at Gloucester, where he first carried on business near Westgate Bridge. In 1872 he was elected to serve on the Town Council, and in 1878 he was made an alderman and retained that office for sixteen years. He became Mayor of Gloucester in his 80th year. The funeral took place on the 19th inst.

MR. J. A. RAEMAKERS.—Mr. J. A. Raemakers, the sculptor, whose bust of Sir John Monckton was unveiled at the Mansion House on the 16th inst., died on the 19th inst., as the result of a fall at his residence in Warwick-road, Maida Vale. He was in his sixty-third year. For many years past he has been an exhibitor at the Royal Academy and the various Salons.

NEW CHURCH, COATBRIDGE.—The new church of St. Patrick, Coatbridge, N.B., is to be commenced at once from the designs of Messrs. Pugin & Pugin, of London.

GENERAL BUILDING NEWS.

PROPOSED THEATRE, BRISTON.—It is proposed, says the *South London Press*, to erect a theatre at Brixton, the front elevation of which will abut on to the same thoroughfare as the Tate Library. The entrance to the circle and boxes will be beneath a tower, while the public approach to the auditorium will be from Ardville-road. The theatre will be capable of accommodating about 2,000 persons. The auditorium will measure 60 ft. by 50 ft., and the stage will be 80 ft. by 40 ft. Above will be the dress circle and gallery, both of which will be supported on the cantilever principle, by which all columns will be dispensed with. Concrete and iron are being used in the building. The vestibules will have tiled mosaic floors. Excepting the tower the theatre will be entirely isolated, and will be lighted by electricity. The architect of the new theatre is Mr. Frank Matcham. Mr. Wheeler has been entrusted with the contract.

EXTENSION OF BUSINESS PREMISES, NEWCASTLE.—An extension has been made to the premises occupied by Messrs. Bainbridge & Co., of Newcastle. The work has been carried out by Messrs. Knowles, Armstrong & Co., architects, Newcastle. An addition has also been made to the establishment of Messrs. James Coxon & Co., drapery warehousemen, Newcastle. The new portion is on the Grey-street side of the firm's premises, which now run from No. 79 to 85. The establishment will be lit by electricity. The new portion was designed by Mr. James T. Cackett, architect, Newcastle, and the contractor was Mr. Thomas Weatheritt.

SCHOOL BUILDINGS, CHARFIELD, GLOUCESTERSHIRE.—On the 20th inst. the new buildings which have been erected for the National Schools, Charfield, were opened. The new schools, which have been built from designs supplied by Mr. W. W. Bethell, architect, Queen Anne's Gate, Westminster, provide accommodation for upwards of one hundred children. The style harmonises with the architecture of the church, the material used being local sandstone, with Bath stone dressings. There is a room for the mixed school 38 ft. by 18 ft., and an infants' room 18 ft. by 18 ft. The cloak-rooms, gables, and half-timber work are in oak. Adjoining is a residence for the schoolmaster.

NEW PUBLIC HALL FOR WARRINGTON.—The contract for the new Public Hall, Warrington, has just been let to Mr. R. W. Collins, builder, Warrington. The cost will be about 5,000l. The site is near the present Gymnasium, Palmira-square. Mr. William Owen is the architect.

PROPOSED NEW BATHS FOR LEEDS.—The Leeds Corporation have applied to the Local Government Board for sanction to borrow 50,000l. for the erection of public baths and wash-houses in the city. Major-General Henry Darley Crozier, R.E., one of the Local Government Board inspectors, held a public inquiry in the Council Chamber at the Town Hall on Tuesday, relative to the matter. Mr. Harrison, the Town-Clerk, explained that the Baths and Wash-houses Committee had determined to carry out a complete scheme, proposing altogether to erect five baths. At present, however, they had only decided to build two of these, one on the land known as the Midden in Union-street, and the other on a site near the viaduct in Kirkstall-road. These two baths had been roughly estimated to cost 8,000l. each. The application by the Corporation was for 50,000l., the sum in round figures which it was estimated would be required to complete the scheme. In each of the proposed buildings there were to be two swimming-baths, ten second-class slipper-baths, five first-class slipper-baths, and five ladies' slipper-baths. One of the swimming-baths would be set apart half a day each week for the use of ladies. The total cost of the two buildings was 18,478l. 12s. 5d. Mr. Hanstock, the architect of the proposed baths, then explained in detail the plans. The Inspector afterwards visited the two sites.

CLERGY HOUSE, ST. GERMAN'S, ROATH, NEAR CARDIFF.—On Tuesday Viscount Halifax opened the new Clergy House for St. German's, Roath. The building has recently been erected on a site adjoining the church, the architects being Messrs. Bodley & Garner, of London, and the builders Messrs. Shepton & Sons, Cardiff. The building is in the Gothic style, and is built of stone. The ground floor consists of study, library, dining-room, two sitting-rooms, kitchen, scullery, &c., and the first floor of seven bedrooms, servants' room, bathroom, and conveniences. The contract price was over 2,000l.

HIGHER GRADE SCHOOLS, HANLEY.—A block of buildings, erected by the Hanley School Board for school purposes, was opened a few days ago. The architect was Mr. E. E. Scrivener. The school is calculated to accommodate 720 scholars.

CATHOLIC CHURCH, WESTBURY.—The new Catholic Church which has been erected on the ground of the Convent of St. Anthony at Westbury, and is dedicated to the Sacred Heart of Jesus and to St. Aldhelm (the first Bishop of Sherborne), has just been opened. The building was built by Mr. Kitch, of Bridgwater, from plans, says the *Western Chronicle*, designed by the Rev. Father Scoles, of Yeovil, and together with the ordinary furniture, has cost about 4,000l. The chapel is built chiefly after the Early English style, the only exception being the sanctuary, which is decorated with



carvings. The walls of the building are of local stone, with Ham stone dressings. The roof is covered with Major's (Bridgewater) patent weather-proof vitrified blue tiles. The interior of the walls is stuccoed, of a pale salmon tint; the floors of the choir and nave are of patent pitch-pine blocks, the sanctuary being laid with encaustic tile paving. The church is ceiled with pitch-pine. It is composed of a nave, 54 ft. long, 22 ft. broad, and 43 ft. high; the sanctuary, which is approached by two steps, is 23 ft. deep and 21 ft. broad. The side chapel is on the epistle side of the sanctuary, and, opposite it, and divided by three arches, is the nuns' choir, which is 36 ft. by 20 ft. At the end of this is the cloister, communicating with the convent on the ground floor, and a tribune, with approach from the infirmary, on the first floor. On entering the church is a statue of the Sacred Heart of Jesus; a kneeling figure at the feet of St. Mary; and about half-way up the figure of Our Lady is placed in an upright position. The altar is in the sanctuary, the front of which is divided by four marble columns in three compartments, the centre one filled with a bas-relief representing the death of St. Joseph, and the side openings contain statues of St. Ignatius and St. Aldhelm. The tabernacle rises above the marble altar stone, and has one of Hardman & Co.'s brass repoussé doors in front with German gold only columns at the sides, with angels above. The reredos consists of an arched, which extends the whole width, and is supported by marble columns, the throne of the Blessed Sacrament rising from the centre to a height of 20 ft. This work was executed by Mr. A. B. Wall, of Cheltenham. A statue of the Sacred Heart of Jesus, in the act of blessing the town, is placed in the apse over the sanctuary, and is 15 ft. high, while the niches to the apse buttresses are filled with the two statues of St. Anthony and St. Aldhelm.

**CIMETERY CHAPEL, ALTRINCHAM.** The foundation-stone of the cemetery chapel at Hale, Altrincham, where the Altrincham Local Board are expending nearly 10,000l., was laid on the 18th inst. by Mr. Alderman Griffin. The chapel is being erected from the designs of Mr. W. Owen, A.R.I.B.A., of Manchester, Mr. John Matthews, of Nantwich, being the principal contractor. The new building, which will be entirely faced with stone, is in the Decorated Gothic style, and will comprise chancel, nave, large mortuary, vestries, &c.

#### SANITARY AND ENGINEERING NEWS.

**THE FUTURE WATER-SUPPLY OF WORTHING.**—Mr. Baldwin Latham has so far completed the hydrogeological survey of that part of the South Downs which is likely to afford a supply of water to Worthing as to be able to point out the positions which might be selected for the purpose of constructing a waterworks. It may be taken for granted, he says, that there is no area sufficiently large in itself anywhere in the vicinity of Worthing from which sufficient water can be procured for the town supply, and which is entirely free from the influence of populations. He has indicated upon a plan submitted to the Corporation—three sites (A, B, and C), in the neighbourhood of Worthing, which are the most free from pollution. Of these sites he regards C as the most suitable, provided a well is sunk sufficiently far removed from the existing swallow holes which are located to the south, south-east, and east of the proposed site. The site C is located in the parishes of Parham, Angmering, Clapham, Burpham, Patching, Findon, Storrington, and Amberley, and is sparsely populated, containing a population of twelve persons per square mile, and will be capable of supplying in a low-water period not less than 900,000 gallons a day, which it is possible to increase. If this be selected, Worthing will possess, in the opinion of Mr. Latham, a site unsurpassed in the country for the purity of its water-supply and its freedom from risk and liability to contamination. In view of the steps that are being taken there is little question that the lesson taught by the visitation of the unfortunate epidemic last year will bear excellent fruit, and that before long Worthing will leave little to be desired, not only in regard to water-supply, but to matters affecting general sanitation also. We congratulate the authorities on their display of energy towards the attainment of so satisfactory an end. —*Lancet.*

**ELECTRIC LIGHTING IN MANCHESTER.** On the 18th inst., electric lighting works were opened at Manchester, in Dickinson-street. The system of generation and distribution that has been adopted is in accordance with plans designed by Dr. J. J. Hopkinson, consulting engineer to the Corporation. It is the system known as the five-wire system, by which a direct supply is obtained by a continuous low-pressure current. The engine and dynamo house is 200 ft. long, 80 ft. wide, and 43 ft. in height, and is lined with glazed bricks throughout. It is divided into two bays, and at an elevation of 10 to 12 ft. travels on longitudinal girders the whole length of each bay to facilitate the handling of the machinery. There are ten engines of the compound vertical condensing type, working at a pressure of 120 lb. The dynamos, ten in number, are driven by linked leather belts with jockey pulleys. The switch-board is of special design, with horizontal and vertical bars, and is so arranged that any pair of

feeders may be coupled to any large dynamo, or the several feeders grouped in any arrangement on one or more of the dynamos. The plant at present provided is estimated to supply 20,000 incandescent lamps of 16-candle power, and already current is being actually supplied to 18,594 lamps of 16-candle power, 250 arc lamps, and motors to the extent of 16-horse power. The mains by which the current is distributed to the consumers consist of bare copper strips supported on porcelain insulators, set in concrete conduits and insulated rubber cables in cast-iron pipes. The resident electrical engineer to the Corporation, who will have the supervision of the works, is Mr. C. H. Worthingham.

#### FOREIGN AND COLONIAL.

**FRANCE.**—By a Presidential decree the Société Centrale des Architectes has been authorised to accept a legacy of 15,000 francs from the architect Guérinot, to be used in founding a prize or scholarship. —M. Gréme has been commissioned to execute the bust of M. Prevost-Paradol for the Gallery of the Académie Française. —The competition designs for a new postage stamp are to be sent in on May 1. —An important exhibition of the works of Manet is open in the Durand-Ruel Gallery.

The subject given to the architectural students competing for the Prix de Rome is "Une École Centrale des Arts et Manufactures." The works undertaken in carrying out a sewer in Rue Jean de Beauvais have led to the discovery of the remains of a Roman erection in brickwork, as well as those of a Mediaeval monument well known formerly under the name of "Puits Certain." —M. Dolivet, the architect, has been commissioned by the town of Rennes to execute a monument to be raised to the Breton "mobiles" who fell in the Franco-German War. The monument will consist of a pyramid with a female figure, holding a palm branch, in front of it. At the four angles will be four statues, a Zouave, a sailor, and two armed "mobiles." The monument which has been raised at Asnières, to the memory of Du Rand-Claye, the eminent engineer, has just been completed. —It is now definitely announced that the Société Nationale des Beaux-Arts will exhibit at Antwerp, occupying a place near that assigned to its rival the Société des Artistes Français, and of equal extent. —The congress of the French Archaeological Society will be held at Saintes and at La Rochelle, from May 25 to June 6.

MM. Wulliam & Farge, architects, of Paris, and M. Levesque, engineer, have obtained the first premium in the competition opened at Nevers for two new markets. —An exhibition of decorative and industrial art and fabrics exclusively manufactured in the departments of the Meurthe and Moselle, Meuse, and Vosges, will be held at Nancy from June 25 to July 15. —Marseilles is about to erect large public abattoirs, with a market and stabling for animals adjoining it. —The Orleans Railway Company are about to construct, for the crossing of the Sioule by the railway line from Pau to St. Eloy, a bridge higher than that of Garabit, hitherto the highest in France. The bridge, an iron one, will cost three million francs and will be 135 metres above the river level, and 375 metres long. It will be carried on two lofty stone piers. —The thirty-first Exhibition of the Société des Amis des Arts de la Somme will be opened at Amiens on June 3, and remain open till July 16. —The formation of ports at Sousse and Sfax, in Tunisia, is talked of. —VENUE.—Messrs. Bruno Gruber and Otto Hofer, both on the staff of the late Baron Hasenauer at *Atelier*, are now to succeed their deceased master as architects of the new "Hofburg," or Royal Palace, which is to be completed by the end of the century.

—According to the last annual report of the Austrian "Ingenieur und Architekten Verein," which has its seat in Vienna, this body has now over 2,300 members, of whom 1,360 are resident in the capital. The library now contains about 7,000 volumes; the increase is mainly due to a bequest of the late Herr August Fölsch. —The monument to the late Von Schmidt is to be ready by next spring. Herr von Hoffmann is the sculptor, and Herr Deininger the architect.

**GREECE.**—The production of Portland cement in Greece last year amounted to 10,800 tons. Of metal ores there were produced 142,445 tons of iron ore, 157,756 tons of manganese ore, 11,716 tons of manganese, 1,470 tons of chromium ore, 10,100 tons of magnesite, 2,380 tons of lead ore, 24,769 tons of galena, and 1,479 tons of emery.

**GERMANY.**—The Emperor has sanctioned the proposal for the erection of a Bismarck monument in front of the Colonnade of the Reichstag building.

The President of the Council, Count Eulenburg, who was also approached as to the advisability of rendering the Berlin Industrial Exhibition of 1896 a universal industrial show, has followed the example of the Chancellor by declining to sanction any extension of the original scheme. The Executive, which has been strengthened by the addition of two members of the Chambers of Commerce, is now trying to find a suitable site; a plot of ground close to the Lietzen Lake is mentioned as the probable position. The guarantee fund is increasing rapidly, whilst applications for space are almost too numerous. —The success of the Berlin Art Exhibition, in spite of its "scratch" character, has

encouraged its promoters to arrange for a repetition next year, with a view to making it an annual event. —The long-talked-of restoration of the former Electoral Palace at Mayence will probably be taken in hand very shortly, the Hessian Chamber having now voted 15,000 for this purpose on condition that the contributors another 30,000. At the same time "Lagerhaus," which was built on to the castle of Napoleon's time, is to be transformed into a museum for the reception of the Roman statues and antiquities. —In view of the Elbe-Trave Canal, Stettin Chamber of Commerce has petitioned the Minister of Finance for further improvements in waterways between Berlin and Stettin. —Towards the further decoration of the Dusseldorf Town Hall, which will take the form of the painting by Bauer, Klein and Neuhaus. —At the meeting of the Berlin Archaeological Society, H. Heyne lectured on the excavations undertaken at the Royal Museums under his direction at Magnesia on the Mæander in Asia Minor. The examination of the Artemision, built by Hermogenes, which has been abandoned by the French expedition of 1880, owing to the extremely unhealthy climate, is thoroughly completed; in the building found, tally in every way with Vitruvius' description. The Temple faces the west, and has eight columns each end and fifteen on either side; the cella is three aisles. The whole building is supported on platform which is reached by nine steps.

#### MISCELLANEOUS.

**REKEDON, NORTH LAIN CHURCH.**—At No. 17, New Parish Church, on the north-west border of Dartmoor, a reredos has just been erected. It is divided into three compartments, the central one being canopied and gabled. In the midst is representation of the Crucifixion carved in high relief. On the north side is the figure of Mary. The reredos is made, in its entirety, of Caen stone. The work has been carried out by Messrs. H. Hems & Sons, of Exeter.

**GLASGOW BUILDING TRADES EXCHANGE.**—A general meeting of the members of the recently formed Building Trades' Exchange for the city of Glasgow was held on the 18th inst. for the purpose of considering the report of the Committee appointed to draw up a scheme for the organisation of the Exchange. The Chairman, Mr. Andrew Gray, said it was very gratifying that the meeting of the Exchange had been gone into so actively, and was glad to see present representatives from architects, measurers, and builders in the city. He wished to have the hearty co-operation of all connected with the building trade, as the Exchange intended to assist all connected with the trade. He had not the slightest hesitation in saying that he believed that before long they would have one of the best Building Exchanges in the world, not excepting any of the flourishing Exchanges in America. The report regarding the organisation of the Exchange was then submitted. The Association is to have a capital of 10,000l., divided into 10,000 shares of 100l. each, and the membership is to be of a corporate and non-corporate character. There is to be an Executive Council of twenty-one members. The report was adopted, and Mr. W. M. Cunningham, writer, 39, West Regent-street, was elected Secretary, and Sir William Arrol President.

**POLYTECHNIC EDUCATIONAL HOLIDAY TOUR.**—The students' trip to Paris has been arranged. Whitsunday is especially for art and architectural students. The party will leave Hobart Viaduct on Friday, May 11, at 8.15 p.m., and the first-saloon on boat, and second-class rail, will depart on Friday, May 11, at 8.15 p.m., and the party will arrive in London at 6 a.m. Tuesday, the 15th. The fee, including hotel expenses to *bona-fide* students of the Polytechnic, will be at 10s., and to others at 15s. A special fee of 10s. will be charged for those who have not arranged for building students and members of art classes. The party will leave London July 20. Any student desirous of taking advantage of either of the above tours should communicate with the secretary, the Polytechnic, 309, Regent-st., W. **CRYSTAL PALACE SCHOOL OF PRACTICAL ENGINEERING.**—On Saturday last the students and friends of the Crystal Palace School of Practical Engineering assembled in the lecture theatre at Crystal Palace, when certificates were distributed to those who had been successful during the past year by Sir Edward H. Carbutt. The reports of examiners upon the work of the students during the last term bore testimony to the high standard of efficiency which continues to characterise the school, not only in the practical and civil engineering departments, but also in the electrical section. Sir E. H. Carbutt, in addressing the students, said he thought with regard to electrical engineering, that with the exception of America, England was in advance of all other countries. He pointed out that the scope of the work was being afforded more and more every year to the members of the engineering profession, that whereas the capital of the Crystal Palace Company was but a million and half, the nation now spent in the construction of a single battleship a million of money, and it necessitated an amount of work for those engaged in it



structing the engines, machinery, watertight bulkheads, &c. The chairman contended that there was every inducement for young engineers to work hard in connexion with their profession, and he believed that in this country there would be demands upon their services as much in the future as ever there had been in the past. Mr. Green, Mr. Rait, and Mr. Wilson also took part in the subsequent proceedings, the former strongly urging the desirability of founding an "Old Students' Society."

**PLUMBING WORK IN BELFAST.**—The Lord Mayor of Belfast presided at the fourth annual meeting of the Ulster District Council for the National Registration of Plumbers at the Town Hall on the 16th inst., and, in moving the adoption of the report, said that it was satisfactory to note that the plumbing work in Belfast had very much improved during the last three or four years, and he thought this was most creditable to the master plumbers and their workmen.

**CO-OPERATION IN THE BUILDING TRADES.**—A meeting was held at the Club and Institute Hall, Merkenwell-road, on the 21st inst., when representatives from various building trade unions met to discuss the possibility of co-operation, and to consider the scheme submitted on behalf of the General Builders' Co-operative Association. The chairman, Mr. W. J. Pease, of the Amalgamated Carpenters and Joiners, to open the discussion. Mr. Vivian, with a passing reference to the benefits secured by the influence of the different trade unions, pointed out that although these organisations were doing good work, some of the workers felt that they must now turn to co-operation as a means of bettering the condition of those engaged in the building trade. He pointed out that the building trade had been tried successfully in various industries. There was, for instance, the Walsall Padlock Society, which, although it had only 83¢ capital at commencement, had now 3,767¢ of loan capital and a reserve fund of 1,500¢, while wages were paid on an average of 10¢ per cent. over the usual trade union rates. In the building trade they had a better opportunity than in most other trades of forming a co-operative society, inasmuch as they received better wages and worked shorter hours than most other trades. They had already arranged a constitution for a society, which they suggested should be called the General Builders' Co-operative Society, and they proposed to form a branch in every district. They proposed that the society should build for their own members, and should compete with the jerry builder. They did not, however, propose to commence active business until they had at least several thousand pounds of capital. The meeting accepted a resolution commending the report to the members of the building trades for approval.

**WOLVERHAMPTON MASTER BUILDERS' ASSOCIATION.**—The inaugural dinner of the Wolverhampton Master Builders' Association took place on the 19th inst., at the Star and Garter Hotel, Wolverhampton. Mr. Henry Gough occupied the chair. The Chairman proposed "Success to the Association, and in doing so he said it was a young association, and he expressed his hope that by the time next year the membership would be augmented. Mr. Gough, who responded, referred to the carpenters' strike, and said that so far as he knew the present difficulty stood just as it did a month ago. There is no likelihood of any termination at present. It is a very unfortunate thing that the representatives of the different trades do not accept the suggestion to refer the matter to arbitrators. Mr. Gough's remarks were met with the approval of the audience. The Local Authorities, he spoke of the health of the Corporation, School Board, and Board of Guardians had given to the building trade. There was going to be another workhouse built, and the Corporation had been instrumental in securing the erection of a new post-office. The Corporation, however, gave them a lot of trouble with regard to the passing of plans, and he should like to see some legislation which would enable the committee to pass plans more quickly. Councillor Shepherd acknowledged the toast. With regard to the passing of plans, he would point out that public bodies which met about once a fortnight or so could not rush things through, and it took time for plans to be sanctioned by the Local Authorities. He did not think there had ever been any hard and fast rule preventing anyone going on with their building, opposing plans had passed the committee. One point he would like to touch upon, and that was the question of contracts in connexion with the building trade. He had heard of cases when the person whose tender was lowest had not been named. He contended that before any tender was named the name of the person tendering should be placed on the outside. The chairman of the committee would then know whose tender he was going to open; and if there was any particular fault to be found with the firm it could be spoken of.

**NIEPHELI, AMALGAMATED SOCIETY OF CARPENTERS AND JOINERS.**—The thirty-fourth annual report of this society is now in the hands of members. The general secretary states that at the commencement of the year those who are engaged in building secured, in many instances, increased wages and improved working rules. Later in the year there was a series of local lock-outs.

During the year remittances amounting to 3,000¢ were sent to Australasia for benefits to members who had been thrown out of employment by the continued depression in trade there. Assistance had been rendered to the miners in their struggle for a living wage to the extent of 950¢. Turning to the progress made during the past year, the secretary states that 56 new branches were opened, 38 in England and Wales, 12 in Ireland, 3 in Scotland, and 1 in the United States, and 1 in South Africa. On the other hand, 2 branches had been closed in England, 1 in Ireland, and 3 in the United States. The net increase had been, therefore, 50 branches and 3,408 members, bringing up the total to 629 branches and 40,956 members. The income amounted to 109,722¢ 12s. 8d., increase 10,898¢ 12s. 0d.; the expenditure, 109,441¢ 13s. 10d., or 18,596¢ 13s. 11d. in excess of the previous year. Notwithstanding this exceptionally heavy outlay, the cash balance has been increased from 73,639¢ 12s. 5d. to 72,920¢ 11s. 3d. The assets had been estimated at 79,440¢ 1s. 3d. or 21¢ 1s. 7d. per ordinary member. In unemployed benefit—the weekly allowance to members thrown out of work through depression in trade—amounted to 30,508¢ 12s. 5d., or 19s. 5d. per member, being 58¢ 9d. per member more than in 1892, but considerably less than the years 1885 to 1888.

**PRIVATE BILL LEGISLATION.**—The Commons Committee, presided over by Mr. Coddington, proceeded, on the 19th inst., further with that portion of the London County Council (General Powers) Bill, which proposed that the owner of any building designed for use as flats or tenements, the common staircase of which is open at night, should be bound to light such staircase or passage, and to keep the same lighted from sunset to sunrise on every night to the satisfaction of the lighting authority of the parish. Any lighting authority might, by agreement with the owner, undertake the provision and maintenance and lighting and extinguishing of lamps on agreed terms. The proposed clause was opposed by certain owners of model dwellings. The Committee, in passing it, amended the condition that half the cost of the gas consumed, in pursuance of the requirements of the lighting authority between the hours of half-past 11 p.m. and 5 a.m. should be repaid by the lighting authority to the owner half-yearly on demand. Consideration of the remaining provisions of the Bill was adjourned. In the Committee presided over by Sir J. Pease, the Surrey Commercial Docks Bill was under consideration. The Bill proposed the making of a new entrance some distance further down the river to the Greenland Dock, for the accommodation of timber and grain trade vessels, and other works in the dock. The measure was opposed by the London County Council and the Kent Water Company, on ground of interference with streets, sewers, and water mains. The Committee decided not to require the company to make two swing bridges across by the London County Council.

## MEETINGS.

**FRIDAY, APRIL 27.**  
*Architectural Association.*—Mr. R. A. Briggs on "Modern House-planning." 7.30 p.m.

**SATURDAY, APRIL 28.**  
*Architectural Association.*—Visit to All Saints' Church and St. Barnabas' Church, West Dulwich.  
*Queen's College, Cork.*—Mr. Arthur Hill on "The History of Architecture." 8 p.m.

**MONDAY, APRIL 30.**  
*Surveyors' Institution.*—Mr. Harold Griffin on "Weekly Property as an Investment." 8 p.m.  
*Sanitary Institute (Lecture on Meteorology in Relation to Hygiene).*—Mr. R. H. Scott, M.A., F.R.S., on "Barometric Conditions and Air Movements." 8.30 p.m.

**TUESDAY, MAY 1.**  
*Institution of Civil Engineers.*—Mr. W. Colquhoun on "The Manufacture of Briquette Fuel." 8 p.m.  
*Society of Biblical Archaeology.*—8 p.m.  
*Glasgow Architectural Association.*—Mr. John Fairweather on "Planning of Public Baths." 8 p.m.

**WEDNESDAY, MAY 2.**  
*Institute of Builders.*—Annual Dinner, the Grand Hotel, Charing Cross. 6 p.m.

*Royal Archaeological Institute of Great Britain and Ireland.*—FACULTY OF (1) Photographs of Stones from the Drift Deposits, Little Island, U.S.A.; (2) Rubbing of a Monumental Brass, lately found in Tong Church, Shropshire. Paper by Mr. F. C. J. Spurrell on "Remedies in the Steno Collection and on Alchemical Symbols." 4 p.m.

*Society of Arts.*—Mr. A. G. Charlton on "A Night."

*Builders' Foremen and Clerks of Works' Institution.*—Ordinary meeting. 8.30 p.m.

*Edinburgh Architectural Association.*—Mr. Hippolyte J. Blanc on "The Collegiate Churches of Scotland." 8 p.m.

*Institution of Civil Engineers of Ireland.*—Meeting at 35, Dawson-street, Dublin.

**THURSDAY, MAY 3.**  
*Sanitary Institute (Lecture on Meteorology in Relation to Hygiene).*—Mr. W. Marriott on "Moisture, its Determination and Measurement." 8.30 p.m.

*Lecture on "The Relation of Mathematics to Engineering."*—will be delivered by Dr. John Hopkinson, F.R.S. 8 p.m.

**FRIDAY, MAY 4.**  
*Architectural Association.*—Members' Soirée, to be held in the Holborn Town Hall. 7.45 p.m.

**SATURDAY, MAY 5.**  
*Queen's College, Cork.*—Mr. Arthur Hill on "The History of Architecture." 8 p.m.

*Edinburgh Architectural Association.*—(1) Visit to Bield; (2) Visit to Stenton Church.

## RECENT PATENTS:

### ABSTRACTS OF SPECIFICATIONS.

8,319.—**WHITENESSING:** *E. A. Sherratt.*—The apparatus for distributing whitewash or stenciler consists of a pan or well containing the wash or paint to be applied; this pan is attached to an adjustable upright or oblique beam pivoted at its upper end to a revolving brush and moving on wheels. Within the pan is a revolving brush and a smoother. The use of the apparatus so designed is to prevent splashing and damage to carpets, furniture, &c.

8,324.—**DRYING:** *P. J. S. J. Thomas.*—The end of each pipe, according to this invention, serrated or grooved, and these ends are left unglazed; the ends are then dipped in water, so as to make the cement hold. The ends of the pipe are then placed together, but before pressing them tightly, water is thrown inside the socket so as to run down over the cement, and make a perfectly-sealed joint. The ends present a perfectly smooth surface, and when they are set, the ordinary sockets for clay may be used, or cement packing may be employed.

9,201.—**VENTILATORS:** *S. Chitty.*—This invention consists in projecting plates or louvers fixed on to a placed at the back part of the ventilator, having operation the passage of air and an intermediate plate with perforations, so arranged as to prevent a reverse current to the ventilator and to regulate the passage of air.

9,221.—**GRAVITY BRICKS:** *H. Crockett.*—This patent relates to an improvement in the material of which the brick is composed, and the "slip" for glazing, which is made with exact adjustment to the quality of the earth employed in making the bricks.

10,065.—**BENCH HOLDER:** *A. E. Shore.*—According to this patent the object is to hold the work rigidly to the bench. This is accomplished by screwing a wood screw to the bench, and fixing thereto a curved plate by means of fly nut and spikes.

12,285.—**RING SASH-LIFTS:** *W. H. Cooke.*—The rings for lifting sashes are pressed out of metal by a die, and an attachment plate is also made by a similar operation.

19,792.—**SCREWS:** *R. Restall.*—The point of the screw is made in the form of a boring-bit. The shank is reduced in diameter, and a groove is made around it. A slight projection is formed at right angles to the shank, to allow of the clearance of the displaced wood.

19,793.—**ROTARY CISTERNS:** *L. Reiser (Stuttgart).*—Relates to a rotary receptacle for water-closets, inside of which receptacle is a scoop or funnel and conduit, so that at each partial rotation the funnel is filled with water, and on the return of the receptacle to its position the water is conducted to and cleanses the basin.

2,414.—**DISCHARGE IN WATER-CLOSETS:** *S. G. Dutton.*—The specification describes somewhat elaborate mechanical means for discharging the discharge-valve and connecting the funnel and trap to the junction of the soil-pipe.

2,465.—**IMPROVEMENTS IN WATER-CLOSETS:** *G. Thomson and another.*—The essential feature of the closet is a retaining and discharging its water. This consists of a long central tube, to which are attached a number of auxiliary tubes sliding up and down a collar composed of a number of short tubes, so arranged that, when the tube is slid down in its collar, the contents of the closet pass down through the central tube. When the tube is drawn up, the auxiliary tubes cause a number of columns of water to act through the medium of a number of columns of air and press with their united pressure in a contrary direction to the water, preventing its exit. Any excess of water carried over the top of the main tube.

### NEW APPLICATIONS FOR LETTERS PATENT.

APRIL 9.—5,997, R. Dampier, Windows.—6,997, H. Hellier, Sash Fasteners.—7,000, A. Butler, Window Frames.—7,021, J. Becker, Apparatus used as fire-escapes and Scaffolding.

APRIL 10.—7,084, W. Vaughan, Water-tap Fits—7,094, J. W. Brighton, Log Band-saw Adjuster.—7,129, R. Matthews, Whitelead.—7,137, G. Nudien, Parquet-plates for Floors, Ceilings, &c.—7,149, H. Lake, Flushing Cisterns for Water-closets.—7,174, J. Pope, Joining Ploughs.

APRIL 11.—7,028, A. Jones, Joints.  
APRIL 12.—7,266, R. Barker, Joint or Coupling for Water-closet and other Pipes.—7,790, J. Garwood, Joint out Cisterns, working with a Syphon.—7,317, M. Brophy, Hospitals and means of Ventilating same.

APRIL 13.—7,337, J. Tonkin, Door Locks.—7,349, J. Williams and others, Glazing.—7,355, N. Simmonds, Detachable Joint for Water-pipes, Soil-pipes, Sewers, &c.—7,179, N. Simmonds, Flushing-valve and Water-closet Attachment.—7,370, E. Bowman, Water-waste Preventer.

APRIL 14.—7,411, G. Coppington, Scaffolding.—7,415, W. and T. Lox, Joining Traces.—7,420, W. Hodgson, Sash Weights.—7,460, A. Frazer, Joiners' Gauges.—7,471, C. Hodgson, Gully Trap.

### PROVISIONAL SPECIFICATIONS ACCEPTED.

2,197, H. Blake and G. Day, Sash Hanging.—2,824, T. Johnson, Stoves, and the Prevention of Damp or Drought.—4,447, H. Jary and H. Cockell, Drain-pipe Support.—5,121, K. Stickle, Paint Brush.—5,235, J. Spence, Window-sash Fastener.—5,668, J. Noble, Fireproof and Insulating Paint.—5,723, W. Henderson and L. Lawry, Garden Paths and Gravel Walks.—5,743, M. Syer, a Flushing-valve.—5,748, J. Driver and H. Gleedhill, Strainers for Gullies.—5,749, J. Driver and H. Gleedhill, W. Turner, Fireplaces and Ranges.—5,868, W. Morris, Sewer Pipes.—5,869, G. Peacock and W. C. Kiburn, Water-closet.—5,871, for Flushing Cisterns.—5,872, G. Renwick, Appliances for Use when Sawing Mires.—6,025, A. Edells, Mouldings, Canics, &c.—6,027, G. Clinton-Baker, Hinges for Gates and Doors.—6,050, W. Allen, Flushing Cisterns.—6,331, W. Prebble, Protecting Unburnt or Green Bricks Against the Weather.—6,411, J. Welch, Ventilator and Skylight.

### COMPLETE SPECIFICATIONS ACCEPTED.

#### (Open to Opposition for Two Months.)

9,289, W. Hargreaves, Fireproof Stages for Theatres and other Buildings.—11,025, J. Meyer, Window Guards.—12,081, E. Clarendon, Joints for Electric Light Fittings.—1,207, W. Taylor, Door Stop.—4,990, M. Adams, Automatic Flushing Apparatus.

## SOME RECENT SALES OF PROPERTY:

### ESTATE EXCHANGE REPORT.

APRIL 16.—By *Montagu, Robinson, & Watson:* £4 to 70 even, Cornbury-d., Rotherhithe, u.t. 82 yrs., g.r. 14; 4701, 34, 35, 43 to 49 odd, Edleard, u.t. 82 yrs., g.r. 28; 656, 657, 658, 659, 660, 661, 662, 663, 664, 665, 666, 667, 668, 669, 670, 671, 672, 673, 674, 675, 676, 677, 678, 679, 680, 681, 682, 683, 684, 685, 686, 687, 688, 689, 690, 691, 692, 693, 694, 695, 696, 697, 698, 699, 700, 701, 702, 703, 704, 705, 706, 707, 708, 709, 710, 711, 712, 713, 714, 715, 716, 717, 718, 719, 720, 721, 722, 723, 724, 725, 726, 727, 728, 729, 730, 731, 732, 733, 734, 735, 736, 737, 738, 739, 740, 741, 742, 743, 744, 745, 746, 747, 748, 749, 750, 751, 752, 753, 754, 755, 756, 757, 758, 759, 760, 761, 762, 763, 764, 765, 766, 767, 768, 769, 770, 771, 772, 773, 774, 775, 776, 777, 778, 779, 780, 781, 782, 783, 784, 785, 786, 787, 788, 789, 790, 791, 792, 793, 794, 795, 796, 797, 798, 799, 800, 801, 802, 803, 804, 805, 806, 807, 808, 809, 810, 811, 812, 813, 814, 815, 816, 817, 818, 819, 820, 821, 822, 823, 824, 825, 826, 827, 828, 829, 830, 831, 832, 833, 834, 835, 836, 837, 838, 839, 840, 841, 842, 843, 844, 845, 846, 847, 848, 849, 850, 851, 852, 853, 854, 855, 856, 857, 858, 859, 860, 861, 862, 863, 864, 865, 866, 867, 868, 869, 870, 871, 872, 873, 874, 875, 876, 877, 878, 879, 880, 881, 882, 883, 884, 885, 886, 887, 888, 889, 890, 891, 892, 893, 894, 895, 896, 897, 898, 899, 900, 901, 902, 903, 904, 905, 906, 907, 908, 909, 910, 911, 912, 913, 914, 915, 916, 917, 918, 919, 920, 921, 922, 923, 924, 925, 926, 927, 928, 929, 930, 931, 932, 933, 934, 935, 936, 937, 938, 939, 940, 941, 942, 943, 944, 945, 946, 947, 948, 949, 950, 951, 952, 953, 954, 955, 956, 957, 958, 959, 960, 961, 962, 963, 964, 965, 966, 967, 968, 969, 970, 971, 972, 973, 974, 975, 976, 977, 978, 979, 980, 981, 982, 983, 984, 985, 986, 987, 988, 989, 990, 991, 992, 993, 994, 995, 996, 997, 998, 999, 1000.



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LONDON.—For pulling down No. 14, Rye-lane, Peckham, S.E., and erecting shops and flats thereon. Mr. Manning, architect.—  
Allen & Sons ..... £2,865  
Elliot ..... 1,810  
Maiden & Harper ..... 2,985  
Moody ..... 2,612  
Kodwell (accepted) ..... 2,465

LONDON.—Accepted for alterations and additions and sanitary works at Princes-road, Bermondsey, S.E. Mr. R. W. Hobden, architect.—  
J. O. Richardson, Albert Works, Peckham, S.E. £330 0 0

LONDON.—For pulling down and rebuilding Nos. 195 and 197, Newington Butts, Walworth, for Messrs. Mathews. Mr. J. A. Powell, architect. Quantities supplied by Mr. Walter West:—  
Juman & Son ..... £2,340  
Tyerman ..... 2,320  
Smith & Son ..... 2,995  
H. L. Holloway ..... 2,160  
J. O. Richardson ..... 2,100

LONDON.—For the erection of premises, Nos. 12 and 14, Hye-street, Woolwich, S.E., for Mr. Hunt. Mr. H. H. Church, architect. William Street, Woolwich. Quantities by Mr. W. Whincom, 44, Narcott-road, Stoke Newington, N.—  
Multon & Wallis ..... £1,599  
F. Chapman ..... 1,592  
Young & Lonsdale ..... 1,577  
H. L. Holloway ..... 1,593  
Balaam Bros. .... 1,582

LONDON.—For the proposed new entrance to be erected for Mr. Joseph Carter West, situated in Westminster, near the Arsenal Brewery. Mr. John Calder, architect. Quantities by Mr. Edw. Critchlow, the Albert Chambers, Victoria-street S.W.—  
Carter, J. M. .... £1,330  
Foster & Dicksee ..... £2,330  
J. N. & Sons ..... 2,124  
Kilby & Gayford ..... 10,827  
G. Trollope & Sons ..... 16,974  
William King & Son ..... 16,900

LONDON.—For the erection of premises in Hetherington-road, for Mr. J. Pratt. Mr. M. V. Treleven, architect and surveyor, Acre-lane, Bristol, S.W.—  
J. Marsland ..... £680  
J. Price ..... 650  
W. Hammond (accepted) ..... 500

LONDON.—For erecting three fever blocks, mortuary, discharge room, &c., at the Western Hospital, Seagrave-road, Fulham, for the Metropolitan Asylums Board. Messrs. A. & C. Hanson, architects, 15, Leadenhall-street, E.C. Quantities by W. T. Farthing, 46, Strand, W.C.—  
Holiday & Greenwood ..... £3,377  
J. H. Newman ..... 23,333  
L. & Co. .... 24,492  
L. & Co. .... 24,492  
Common (accepted) ..... £23,950

LONDON.—For erecting two boiler-rooms and fitting-up hot water warming apparatus to the two existing blocks of the Eastern Hospital, Hoxton, for the Metropolitan Asylums Board. Messrs. A. & C. Hanson, architects, 15, Leadenhall-street, E.C.—  
J. & F. May ..... £680  
J. & F. May ..... 680  
J. & F. May ..... 680  
J. & F. May ..... 680  
J. & F. May ..... 680  
J. & F. May ..... 680  
J. & F. May ..... 680  
J. & F. May ..... 680  
J. & F. May ..... 680  
J. & F. May ..... 680

LONDON.—For new billiard room and other additions to the "Bell Inn," Hendon, N.W. Mr. H. Hardwick Langston, architect. 5, St. James-street, Bedford-row, London. Quantities not supplied.—  
T. H. Hyde ..... £1,845  
J. Allen & Son ..... £2,370  
T. H. Hyde ..... 350

LONDON.—For additions and alterations to business premises, for Mr. Walter Colby, Sydenham. Messrs. James Joly & Son, architects, 66, Cannon-street.—  
No. 1. .... £2,414  
No. 2. .... £2,414  
No. 3. .... £2,414  
James Carmichael ..... £2,414  
Waddington ..... 2,335  
Bullock ..... 2,385  
Henry Lacey ..... 2,353

MANCHESTER (Notts).—For laying sewers, with manholes, &c., Westfield-lane and Chesterfield-road. Mr. R. Frank Vallance, Borough Surveyor, Mansfield.—  
Westfield-lane. .... £276 14 5  
Chesterfield-road. .... £276 14 5  
J. H. Vickers ..... £276 14 5  
James Bradley ..... 241 19 0  
W. Fisher ..... 231 0 0  
W. A. Vallance ..... 246 0 0  
Jno. Greenwood, Mansfield ..... 210 0 0

NORTHAMPTON.—For new house and bakery premises, for Mr. W. T. Skempston, Althorpe-road, Northampton. Messrs. Mosley & Anderson, architects and surveyors, Goodyear-chambers, Northampton. Quantities by architect:—  
J. Woodford & Son ..... £2,115  
E. D. Shuman ..... 821 0  
G. J. Fisher ..... 777 0  
Harrison & Son ..... 777 0  
J. Garrett ..... 765 14  
J. Dunckley ..... 765 14

OTLEY.—Accepted for the erection of twenty-four cottages, 1, Leeds-road, for Mr. John Vickers. Mr. A. Mitchell, architect. Otley, Leeds. Quantities by architect:—  
Hindley—Wm. Simpkins, Hunsley ..... £2,150  
Hindley—James Jennings, Otley ..... 755 0  
Hindley—James Suttie & Sons, Otley ..... 130 0  
Hindley—Andrew Taylor, Eccleall ..... 190 0  
Hindley—Geo. Kendall, Otley ..... 25 0

ST. AUSTELL (Cornwall).—For additions to school buildings for the St. Mewan School Board.—  
Carpenter and J. Mayors—Smith & Brent, West End, St. Austell ..... £276 15 0  
Mayors—J. R. Stone, St. Austell ..... 175 0  
Mayors—Thos. Bennett, Fore-street, St. Austell ..... 110 0  
Mayors—T. Waters, St. Austell, Gram-pound-road ..... 100 0  
Mayors—T. J. R. Smith, St. Austell, Gram-pound-road (accepted) ..... 95 0  
Mayors—John Cook, St. Austell, St. Austell ..... 100 0  
Mayors—Hankin & Dismek, Mount Charles, St. Austell ..... 91 0

SOUTHAMPTON.—For the erection of Central Board Schools, with offices, boundary walls, caretakers' houses, &c., for the Millbrook School Board. Mr. A. C. Gutteridge, architect. Quantities by Messrs. W. H. Mitchell & Son, 9, Portland-street, Southampton.—  
School. .... £1,460  
House. .... £280  
Total. .... £1,740  
T. H. Kington ..... 990  
Light & Son ..... 283  
Stevens & Co. .... 900  
H. G. Tucker ..... 2,681  
Jenkins & Son ..... 2,555  
H. Cawte, Southampton ..... 2,300

SOUTHAMPTON.—Accepted for alterations and additions to the "Ship Inn," Northam-road, Southampton. Messrs. W. H. Mitchell, Son, & Gutteridge, architects:—  
Playfair & Toole, Southampton ..... £263

SOUTHAMPTON.—Accepted for alterations and additions to the "Uncle Tom's Cabin," public house, Millbank-street, Southampton. Messrs. W. H. Mitchell, Son, & Gutteridge, architects:—  
H. Stevens & Co., Southampton ..... £260

SOUTHAMPTON.—For construction of new road and culvert, &c., on the Southampton West Building Estate. Messrs. W. H. Mitchell, Son, & Gutteridge, surveyors:—  
J. Jones ..... £561  
F. & J. Young ..... 637 0  
ampton (accepted) ..... £575 10

SOUTHAMPTON.—Accepted for alterations and additions to "Brown Hill," Burdett. Messrs. W. H. Mitchell, Son, & Gutteridge, architects:—  
H. Cawte, Southampton ..... £1,544 0 0

501 THAMPTON.—For alterations, &c., to "Coachmakers' Arms," Southampton West:—  
House. .... £231  
Fitting. .... 22  
Total. .... £243  
J. Jones ..... 329  
Warden ..... 315  
Hale ..... 315

SOUTHAMPTON.—For new shop, bakery, &c., Lodge-road, Southampton. Messrs. W. H. Mitchell, Son, & Gutteridge, architects:—  
J. Jones ..... £142 0 0  
F. Mansfield, Southampton (accepted) ..... 399 17 0

SOUTHAMPTON.—For the erection of coach-house, stabling, &c., at the "Cowbirds," public-house, for the Corporation. Mr. W. R. G. Bennett, Borough Surveyor, Southampton. Quantities by architect:—  
J. Jones ..... £1,198 0 1  
Raghu & Sons ..... £515  
J. W. Rowland & Son ..... 467  
J. W. Rowland & Son ..... 467  
J. W. Rowland & Son ..... 467  
J. W. Rowland & Son ..... 467  
J. W. Rowland & Son ..... 467  
J. W. Rowland & Son ..... 467  
J. W. Rowland & Son ..... 467  
J. W. Rowland & Son ..... 467

WEST ARDSLEY (Works).—For the erection of nine scullery houses, with, &c., Westerton, for the British Cooperative Society Limited. Mr. Jno. H. Brearley, architect, Commercial-street, Baiter.—  
Mason—Edward Pickles ..... £790 0  
Turner—Henry Brooke ..... 293 5  
Turner—G. J. W. Wain ..... 293 5  
Plasterer—Wm. Poulton ..... 72 0  
Slater—J. M. Thornton ..... 62 15

WESTON-SUPER-MARE.—For the erection of cottage residence, Wallscote and Seven-road, Weston-Super-Mare. Mr. H. Dare Bryan, architect, 36, College-grove, Bristol.—  
Stephens, Baiter, & Co., Ltd. .... £1,198 0 1  
Chas. Taylor ..... 765 0  
Hatherley & Carr ..... 1,257 0  
Chas. Addicott ..... 1,015 15  
Jno. Palmer ..... 930 0  
H. W. Pollard ..... 660 1

WIMBORNE.—For the erection of a new residence and stabling, Wimborne Park. Mr. H. Phelps, architect, 29 and 30, King-street, E.C. Quantities supplied:—  
Jones & Richards ..... £2,479  
Adamson & Son ..... 3,351  
Garrett & Son ..... 3,491  
J. Horrocks, Croydon ..... 3,009

WIMBORNE (Cumberland).—For the erection of four houses, Curwen-street, for Mr. S. Douglas. Mr. Jas. Hovell, architect, Lonsdale-street, Workington.—  
Lister, McCarty, & Co. .... £1,419 13  
J. I. Wilson ..... 1,405 13  
Jno. Coulthard ..... 1,400 0

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ampton (accepted) ..... £575 10

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# The Builder.

VOL. LXVI. No. 2674.

MAY 5, 1894.

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### Architecture at the Royal Academy.



HERE is no special point of attraction in this year's collection in the Architectural Room of the Academy. Nor can one recognise in the collection the illustration of any special architectural tendency of the day; the tents of the room seem, if anything, more miscellaneous than usual. The general appearance of the room is attractive, however; standard of work is quite up to the mark, and there are a good many interesting drawings. The arrangement of drawings has been again in the hands of Mr. Waterhouse, who has repeated his excellent and effective system of grouping, far as possible, the works of the same exhibitor, and to some extent works of the same class also, as far as the two objects can be made compatible.

Taking the work of Academicians first, we find them less represented than usual. Three tent, Mr. Norman Shaw, Mr. Pearson, Professor Aitchison, do not exhibit; and others, Mr. Waterhouse and Mr. Jackson, exhibit one drawing each. Taken in alphabetical order, we find first, four drawings by Sir Arthur Blomfield. All of these are light pencil drawings, presumably the architect's own hand. Two of these refer to St. Saviour's, Southwark. The Memorial Stalls" (1,515) in that church is in pure Gothic style, of rather late character of detail, with some pretty tracery elements in front of the desk, and a backing terminating in a cove crowned with a crest and pinnacles. The south transept (1,518) is a piece of simple, solid Gothic work, to which some special interest is attached by the addition of a small elevation of the transept as it appeared in 1822. The window there looks like an Early Perpendicular one, with its tracery and cusping shorn away, and a bare expanse of blank wall below it. The restored design in the view shows the same mullions, with tracery in keeping with the date inserted between them, and the old sill transformed into a battlemented transom, through which the mullions are carried to form

a wall-arcade below, with a new sill and string inserted. Whether the actual material of the old mullions in the window is retained there is nothing to show; but the restoration is a very successful bit of working up of the old lines of the architecture. The new choir schools of Magdalen College are shown in two very agreeable and unpretending pencil drawings (1,524, 1,530); the building is quite a perfect bit of old-fashioned collegiate Gothic, with some touches of Renaissance detail in the treatment of the doorway and the straight cornices over the windows, not returned downward as labels. The buildings group very well, though we wish there had been a plan to explain the grouping. Whether this mere reproduction of the ancient collegiate style is all one should look for in modern college buildings of course is a question that may be raised; but it will please many people, perhaps the majority, and is at all events better than anything, however "original," which clashes with the prevalent feeling of the locality.

Mr. Bodley exhibits his competition design for the same buildings, in a view showing the inside of the quad, or rather of the space partially enclosed by buildings which extend round two sides and half the third side of the site. These are also purely collegiate Gothic in the same general style. On the right there is seen what appears to be a chapel, an addition of which there is no visible hint in Sir A. Blomfield's design, and here again a plan would have added greatly to the interest of the drawing. The same architect's "Sketch for Proposed New Church at Eccleston" (1,538), is in the most conservative Gothic style possible, shown in a pencil drawing in which there is no attempt at any "effect" whatever, not even of surface texture, nothing but pencil lines and a few shadows. It would be impossible to find a fault with the design except that it might just as well be a sketch of an ancient church, and it is rather curious to see under the same name the "Church for the Society of St. John the Evangelist, Cowley St. John, Oxford" (1,545), a small pen-line drawing by apparently a different hand, and showing a much more modern treatment. In the foreground is a short sturdy square tower, with a square projecting stair-turret breaking it not at the angle but up the centre. A certain character is given by this incident.

Mr. Jackson's drawing of the interior of

Radley College Chapel is reproduced among the illustrations in the present number, to which we may refer the reader. As will be seen, it is a design mainly in Late Gothic style, but with various original touches in detail; in fact, though Gothic, it would be impossible, even in a drawing, to take it for ancient Gothic. The unity of character, however, in the whole treatment and detail is noticeable.

Mr. Waterhouse exhibits a large water-colour drawing in his well-known and powerful style of colouring, of the "Prudential Assurance Buildings, Nottingham" (1,714), to which a small plan is appended as a key to the architectural treatment. Mr. Waterhouse has done so many buildings showing special treatment of a triangular corner site that one may imagine that he seeks out such opportunities of developing one of his favourite effects, the strong accentuation of the angle. Here there is a powerful mass of building carried up into a tower at the angle, with angle turrets and a conical leaded roof at the top; in the lower portion the face of this is enriched with pilasters and ornament accentuating the entrance and the windows immediately over it. The building is a terra-cotta one, we presume, from the appearance given to it in the drawing, and exhibits a good deal of the variety and ingenuity which its architect shows in inventing new detail for this kind of work.

The central drawing on the south wall is the large and finely-executed water-colour drawing of the entrance to the hall of the Chartered Accountants' building (1,638) by Mr. Belcher. The building is shown in rather sharp perspective, one result of which is to show that the cornice coming almost immediately over the attached columns, with no frieze intervening, is too heavy for the columns and rather crushes them. It might be said that the entablature would be still heavier if the frieze were not omitted; but the fact seems to be (and it is worth noting) that the employment of the full orthodox entablature tends to keep the cornice, to the eye, in its proper place, separating it from the columns; and the arrangement as it stands does not appear so satisfactory as it did in the elevation exhibited on a former occasion.\* To our thinking, also, the columns flanking the entrance doorway look

\* Published in the *Builder* for August 27, 1892.



rather light in comparison with the very heavy rusticated work which backs them. This may result from the special point of view, or it may be that the draughtsman has unconsciously exaggerated the rustications in the desire to give a powerful effect; but there seems, in this drawing, a little fining down wanted in what is nevertheless one of the most remarkable and original modern London buildings. Beneath it is hung a large monochrome perspective in Indian ink of the same architect's remarkable design for the completion of South Kensington Museum. This drawing is a little flashy in execution and effect; heavy rain-clouds and a wet foreground with "reflections," give a certain sensational effect which the design did not require to show it off; it is a fine and impressive design anyhow; and the details in the drawing do not bear inspection very well, though the general effect is certainly very powerful. In the centre of the west wall hang two large drawings by Mr. H. Wilson, the geometrical elevation and a large water-colour view of an intended reredos for Holy Trinity Church, Chelsea (1,692-3). The elevation is hung too high to be well seen, and in the perspective the detail is not very much made out. The main design is square in outline with a raised centre, and finishes in a forest of pinnacles and statues; in the centre portion is a painting bordered by a heavy moulding which breaks at the upper side and runs up to form the frame to a vertical painting over it, the whole taking the shape of an inverted T. The effect of this is not very good; it seems to weaken the centre constructionally; we should have preferred the panels to be separately designed. The perspective drawing is a most effective though evidently rapid one, executed with that mastery of the brush which characterises Mr. Wilson's drawings, and is perhaps the most striking thing in the room. But after all, is it not rather a questionable thing to erect so large a reredos in front of and hiding the greater part of an unusually large and elaborate east window? We do not know, of course, what data Mr. Wilson may have in regard to the late Mr. Sedding's intentions, but we should hardly have supposed he would have designed so large an east window with any intention to shut out the greater part of it from view afterwards by a reredos. It is the same mistake that has been made at St. Paul's, where the reredos practically shuts out the east end of the church. In Mr. Wilson's reredos there is a certain amount of open work which would allow of the existence of a window behind being evident; but the design of the window would be lost, and in addition to that the reredos itself, seen against the light of the window, will be very much lost as far as much of its detail is concerned; it will be a silhouette against the light; so that on the whole we think this very bold and striking design rather needs re-consideration. Near this is hung the same artist's design for a reredos for the private chapel at Douglas Castle, Lanarkshire (1,699). This is a coloured elevation of what is apparently an alabaster reredos, the upper part bracketed out at each side from a smaller panelled base, the whole resting on a plain square slab which forms the altar. A portion of the surface is treated in flat carved square panels in a style which Mr. Wilson has rather made his own; these are iridescent with colour, beautifully touched on the drawing, which however does not indicate very clearly how the colour is to be produced or applied, whether by surface colouring or introduction of coloured materials. The drawing, at all events, is one of the most effective in the room. In a constructional sense, the lower portion, the supporting portion, looks rather inadequate for the heavy superstructure—in the sense of constructional design we mean, of course; the base seems somewhat crushed under the large square mass above it.

As these drawings have led us towards decorative work, we may notice in the same

connexion one or two of the larger decorative drawings in the room. Mr. Gwatkin's "Design for a Frieze" (1,570), a very large drawing in an effective architectural frame (designed we believe by Mr. Pite) is an unusual work, consisting of scrolls of foliage with broad leaves, treated in a rather realistic style—not the firm-lined scroll of architecture, and with very little positive colour. We cannot help thinking it looks a little too soft and spongy in effect, but it is a striking piece of decorative work nevertheless, and may be regarded with interest as a certain novelty in the use of floral forms in decoration. Mr. G. C. Horsley exhibits a design for a semi-circular corridor ceiling (1,671) drawn geometrically as seen looking upwards, which we confess rather gives us a shock. Has it come to this? A trellis in white, with blue inter-spaces, which must suggest sky seen between, if not positively intended to do so, and in the interstices of the trellis are twined somewhat naturalistic flowers. Stretching across the centre is a painted panel, and in the middle of the side portions smaller square paintings which hang in the middle of the trellis, at least they are only kept in their place by rather inadequate bands which connect them with the centre panel and with a similar band forming the border to the trellis surface. Strangest of all, these smaller panels are treated as interiors in perspective lines. So that the result is, we look up from the corridor to see over our heads a semi-circular trellis with sky between, and leaves twining about it, and at two points in said trellis we look into a box, painted in upward perspective, with a figure in it. Mr. Horsley is always original and interesting—and there is evidence in this very exhibition that decorative ceilings may be designed on the most correct principles and be quite uninteresting—but when we think of his really admirable design for a dome decoration last year, so completely conventionalised and architectural in treatment, we do feel a little scandalised at this escapade. We hope Mr. Horsley will abandon this course, and return to the virtuous paths of conventionality in the future.

A coloured restoration of a ceiling at old Carrington House, by Mr. J. D. Crace (1,660), is a very pretty and interesting bit of work, with a centre lightly treated with wreaths, and a series of square panels with coloured emblematic devices round the margin of the ceiling. Mr. Clement Heaton's drawing of Decoration at the Imperial Institute (1,666) shows a frieze of borders, with escutcheons and the British arms, &c., which is, of course, adequately done, but not very interesting. Mr. Randall's "Portion of a Banqueting-hall" (1,670) shows a marble centre fire-place and decorations, an arch over the fire-place with figures in the spandrels, at the sides a heavy wooden dado effectively treated, with small carved figures introduced at intervals. The space above this is filled with paintings; the general effect is rich, but we do not like the architectural details of the marble work. Mr. John S. Babb's "Pros Olympon" (1,571) is a frieze in the style of one or two others which he has exhibited; a procession of figures in cream tint on a full red ground; in this example he has introduced a new treatment in giving the figures, which are supposed to be in flight, not walking, a slope forward in the direction in which they are supposed to be proceeding; this gives movement to the procession besides introducing a variation of line in the decoration. In the centre of the south wall is hung another important piece of decorative work of a very different class, a cartoon for an altar piece by Mr. G. Woolliscroft Rhead (1,639). This is treated in a very effective manner; the colour is all concentrated in the upper part in an assemblage of angels, treated in a purely conventional and decorative manner, around the head of the cross; at the foot are the bowed figures of the three Maries, in shadowy and colourless, and the bare stem of the cross goes up the

centre of the picture across a background of twilight clouds and a dark horizon. This is a very effective and thoughtful work.

A large sheet of five drawings of Victoria Institute, Worcester (1,575), Messrs. Simpson & Allen, hangs in the centre line of the east wall, and may, taken, we think, to owe its position a good deal to the beautiful drawing of a well-known draughtsman whose hand is evident in it. The entrance, with the main decorative heraldic carving over the doorway, is effective, but the other drawings show what we should call piecemeal architecture; one part seems to have no relation to another; the whole wants put together and bringing under the control of one dominating idea. A plan might have given some excuse for or explanation of the accidental character of the design, however one may desire truthfulness in the external treatment of architecture, we can quite think that breaking up a building into a number of unconnected bits, and plan windows about here and there as it happens, is really architectural 'desecration.' The beautiful execution of the drawings, rather at a disadvantage the perspective view of the design for recasting the block of the National Gallery (1,574), Mr. Statham, which hangs immediately below it; on the other hand the author might have been more explicit in the words of Touchstone, "A thing, but mine own." Certainly we do not think the habit of rushing to a particular draughtsman whose manipulation is supposed to be enough in itself to secure admission of a drawing, is at all an admission. As to the design in question, of course can say nothing here, except mention the composition of the block has been altered (it is to be improved) since the first sketch was published in the New Year's number of the *Journal*, by lowering the drum of the tower. The author's ideas as to the treatment suggested, especially in regard to the windows, were fully set forth in the article accompanied the publication of the sketch in the *Builder*.

Mr. Waterhouse's scheme of group drawings has brought together a little Scotch group on one part of the wall, where Mr. Blanc's large and fine water-colour drawing of "St. Cuthbert's Church, Edinburgh" (1,726) is flanked on one side by Messrs. Simon & Tweedie's composition design for the Congregational church, Heaton Moor (1,718), and on the other by Messrs. J. Burnet, Son, & Company's "Proposed Pathological Buildings, Westminster Infirmary, Glasgow" (1,730). Mr. I. C. Classic church is shown in a view from the north-east, showing the apse and its two flanking towers near the foreground at the other extremity of the building is an octagonal spire rising from a pedimented stage at the top of the tower, the spire, lighted by oval lights half-way up, and evidently designed more or less in the influence of Wren, is a good example of the application of this feature in architecture. The towers or turrets flanking the apse have lanterns which are tastefully treated with short rusticated colonnettes; the apse is covered with lead laid so as to form panels. Pilasters on the exterior of the apse seem rather too widely spaced, leaving an exactly square wall space between the pilinth and entablature, which has rather bald appearance. But in the whole this is a fine example of the application of the English Renaissance style to a modern church. The two other designs just referred to we must speak of on another occasion.


At one of the oblique angle-walls of the room another grouping has been made in the shape of a small collection of designs of marked type; a finely-drawn line interior of Mr. Aston Webb's Church of St. George, Worcester (1,554), an elevation of Mr. Fellowes Prynn's remarkable picturesque church at West Dulwich (1,555), and two geometrical elevations of the Church



of the Good Shepherd at Gospel Oak, by Messrs. James Brooks & Son (1555-6). These illustrate in a rather interesting manner various tendencies in church design. Four works by Mr. Basil Champneys make a collective group on another part of the wall. Mr. Mountford is well represented by a drawing of the entrance and tower of the Northampton Institute, Clerkenwell; the treatment of the upper portion of this tower is unusual and picturesque. To these and other drawings we will return. We regret to see hung on the line the drawing of the proposed centre entrance between the new buildings into the quadrangle of University College. It has been conclusively shown in these columns that this view, made no doubt by a very able draughtsman, is absolutely deceptive, and that no such opening is possible according to the manner in which the present new wing has already been commenced; the view is the result of what at the least must be called an extraordinary architectural blunder, and it is rather too bad that under those circumstances it should figure in the architectural room to keep up the deception.

Referring just now to some geometrical drawings of a church, we may add our usual regret that there are not more geometrical drawings and plans and fewer pictures. And we fear one reason for this is that geometrical drawings are not in favour with hanging committees, as being less attractive. We know of one admirable one at all events, which passed through our hands for delivery to the Academy, the rejection of which we cannot understand except on the supposition that geometrical drawings are not favoured unless sent under important names. The Academy should encourage geometrical drawings of architecture for exhibition, as representing the real facts and construction of the design. Probably the architect members would do so; but they are in the minority. Painters have little interest in architectural drawings properly so called; and it must be confessed that the public, for whom the Academy caters, have still less.

#### NOTES.

HEN the public interest is aroused in regard to the successor to Sir Frederick Burton, as Director of the National Gallery, it is opportune to inquire whether the rule of the Civil Service by which retirement is compulsory at a specified age should be applicable to such posts as those of Director of the National Gallery and of Director and Keeper of the National Portrait Gallery. A rule which may be well applicable to ordinary departments of the State is not necessarily fitted to posts such as the above, for which special qualifications are required. In the Colonial or any other office the younger officials are perfectly fitted to step into the places of their seniors, and exceptional ability will not do work better than plodding carefulness. But when it comes to a question of a judgment in art wholly different considerations arise. On the other hand, it is certainly true that after a man has been in a particular office for a long time, and is practically irremovable, he often becomes crotchety or idle, and therefore it may be that the loss of one kind of special quality is counterbalanced by a more general and continuous efficiency. At the same time, the question requires consideration, and we are inclined to think that while retirement from these posts should be compulsory at a certain age, there should be a power to grant an extension of service from year to year to any age in the case of persons of exceptional judgment and experience.

**T**HE plan on which the London County Council are laying out their Boundary-street improvement scheme at Bethnal Green may promise very well in a picturesque sense, but we fear it is open to grave objections in a practical sense. There is to be a circular public garden in the centre of the

site (the general shape of which is approximately square) and from this streets radiate to the boundaries of the land. As a matter of pleasant effect, there will no doubt be a "point" in the manner in which the garden and its possible trees will be visible as a terminating point down a number of streets; but as a manner of laying out a building plot it is both inconvenient and unhealthy—inconvenient, because the ground is necessarily cut up into very awkward shapes for covering with buildings, and will necessitate some of the buildings being cramped into angles and their rooms not being laid out at right-angles; and insanitary, because it is impossible on a site thus planned to lay out all houses with the best position for sunlight in the rooms, which is one of the greatest requisites for health and comfort in a house. It is the old fallacy of the radiating plan for prisons and asylums, long ago exploded, and now here revived in another form. If some of the radiating blocks are in a good position for getting sunlight into the living rooms, it follows necessarily that others cannot be. The proper way to treat such a site would have been to make a garden right across the centre of it, and arrange the houses in parallel blocks at right-angles to the garden, arranging garden and houses on such an orientation that the lines of houses would all get the best aspect for sunlight. The plan as proposed, and which we fear has gone too far to be reconsidered, is one of those which look very well and symmetrical on paper, but cannot possibly be practically satisfactory in execution; and we can only hope that the County Council will not misuse the opportunities which any other fairly rectangular site may afford them, by laying it out on this radiating plan, the benefits of which are almost entirely illusory.

**T**HE "James Forrest" lecture on the "Relation of Mathematics to Engineering" which was delivered last night at the Institute of Civil Engineers by Dr. Hopkinson, must have revived to a large extent the early enthusiasm of a considerable number of those present whose daily avocations are so calculated to render latent their noblest aspirations. As the lecturer truly remarked, there are engineers who regard their profession as a mere means of making money. To such as these it can only be said that a knowledge of men is of far more use than an intimate acquaintance with mathematical formulae, and the analytical treatment of a problem, be it never so difficult, is of small value compared with the ability to favourably impress a Parliamentary committee. Others, again, it is pointed out, rejoice in their profession because it benefits the race, while others delight in it for its own sake. This, of course, is all quite true, but how few are in a position that will allow them to enjoy the soothing influence of a differential equation in their busy every-day life. A sound knowledge of mathematics is of the greatest value to an engineer—it is, in fact, indispensable—but, at the same time, unless this knowledge is kept most carefully balanced while it is being acquired, it only tends to prevent the possessor making himself useful in the profession. As a general rule, a man with a great knowledge of mathematics is of very little use in an engineer's office; and at the present day one must choose whether one will be a mathematician with a knowledge of engineering, or an engineer with a knowledge of mathematics.

**T**HE case of *Nind v. the Nineteenth Century Building Society*, which was decided by the Court of Appeal on Tuesday last, appears to involve a practical hardship. It was an action by a lessor to recover a sum of money in respect of surveyor's charges and solicitor's costs incurred in surveying certain property and preparing notices to repair. The defendant society was under-lessee of the property, and the question arose whether a lessor could recover such expenses

from an under-lessee. There is no question that a lessor can do so against his lessee, for the second section of the Conveyancing and Law of Property Act, 1892, states that "a lessor shall be entitled to recover as a debt due to him from a lessee. . . . all reasonable costs and expenses properly incurred by the lessor in the employment of a solicitor and surveyor or valuer, or otherwise, in reference to any breach giving a right of re-entry or forfeiture." The Court of Appeal, reversing the decision of the Divisional Court, held that this section applies only to a lessee, and not to an under-lessee. We shall not refer to the judgment in detail, since it deals with minute legal technicalities, but it is the decision of a strong Court, and may be fairly accepted as being correct. This, however, does not prevent the decision from pressing hardly on lessors, and it will doubtless lead to a statutory amendment of the law on the subject.

**T**HE Imperial Houses of Parliament at Berlin, which we illustrated in our New Year's number, are now nearing their completion, and, in fact, the Emperor has practically ordered that they are to be ready for the reception of members by October next. Of course, a good deal of the sculptural decoration and nearly the whole of the frescoes will still be unfinished, but the building will have to be habitable by the time named. The new cathedral has been commenced in accordance with Professor Raschdorff's design. The foundations are being laid on a site generally considered unsuitable for such a building. The Emperor is responsible for the selection of both the site, the design, and the architect. Prussia pays for the building and its representatives grumble at the expenditure. The new National Monument to which we have occasionally referred is to be commenced immediately, the first vote on account having now been passed by the German Parliament. Of the schemes which are now very near their realisation we must note the development of the "Museum Island," where a commencement is to be made with a new "Renaissance Museum." The new Town Hall will probably also now soon be commenced. Of schemes practically only on paper for the present we note one for the new combined National Library, Royal Academy, and Royal Institution on the "Unter den Linden" thoroughfare, a combined permanent Exhibition Building and Oratorio Concert-hall on the site of the present exhibition buildings at the Lehrter Station, and the new Royal Academy Schools in a suburb. The scheme for a new Opera-house has apparently now been definitely postponed for a number of years. Of the essentially utilitarian public buildings in hand, we note the extension of the Imperial Bank, the new Post-office Ministry, the State Insurance Office, and, further, the recent completion of a "Public Wholesale Market." There are some twenty other larger works in hand, though not of such general interest, and to these we must add a formidable list of churches (about fifteen), headed by the memorial churches to Emperor William and Emperor Frederick.

**I**N the new issue of the German Archaeological Jahrbuch (1894, ix, 1) the whole of the plates and the greater portion of the text is devoted to the publication and discussion of the fragments of sculpture from the basis of the famous Nemesis at Rhamnus. A few of the more important fragments were published provisionally two years ago in the *Epigraphie*, but we have now, for the first time, the whole number, forty in all, and accompanying a sketch of a conjectural restoration of the composition. Herr Ludwig Pallat, who discusses the sculptures, thinks that the description of Pausanias (1. 33, 7 and 8) was based on inscriptions, and that hence the attribution of the single figures is certain, the only questions remaining being the fitting of the fragments to the persons named and the arrangement of the



composition. The scene represented, it will be remembered, was Helen being led by her foster-mother, Leda, to her real divine mother Nemesis—present were Tyndareus and his sons, and a man with a horse near him, also Agamemnon, Menelaus, and Pyrrhus, son of Achilles; further a problematic figure called Epichos, and another youth. The nine central figures Herr Pallat arranges with a high measure of probability, and relying chiefly on analogous compositions of approximate date. The group was attributed by Pausanias to Pheidias, and such appears to have been the popular tradition. On the other hand, Antigonos of Karystos expressly states that Agoracritos affixed an inscription to the statue on a little tablet stating that he himself was the sculptor. As no certain work of Agoracritos remains, the question of attribution is a difficult one. Herr Pallat, after a long and detailed discussion, decides for Agoracritos. In the "Anzeiger" of the same number is a long, fully-illustrated paper on the Sidon sarcophagi, which will be the subject of a public lecture this week at Oxford by Professor Gardner—the first, we believe, that has been given on the subject in England.

THE annual report of the Vienna "Oesterreichischen Ingenieur und Architekten Verein" speaks well for the energetic way in which this society performs its duties. Besides twenty-two general and ten business meetings, there were some 50 sectional and 150 committee meetings in the year. Besides the standing committee there were no less than 16 committees at work on different special subjects, such as the classification of cements, iron and steel, the construction of vaults, the development of Vienna, its water-supply, taxation, &c., and farther on competition conditions and professional etiquette. 10,000 florins (or 830*l.*) were spent on the printing of reports by these special committees, and as this is a great drain on the society's resources it has been found necessary to petition the Government for a subsidy to meet this kind of expense, as it is to a great extent the public officials who profit most from the result of the special committee's labours. We observe, however, a remarkable preponderance of engineering subjects among the list of papers read during the session, which seems as if the architects were hardly getting their fair share of attention.

A COMMITTEE has been formed to collect 500*l.* for restoring the ancient flint and stone tower—one of the oldest in the county—of St. Nicholas Church, Deptford. The nave, aisles, and chancel were rebuilt, of red brick, in 1697-8, as Evelyn records in his Diary (August, 1699): "At Deptford they had been building a pretty new church"—and have been repaired and enlarged since. Whilst living at Sayes-court, which he acquired in right of his wife Mary, daughter and heiress of Sir Richard Browne, Evelyn lost two sons (1658), whom he buried in this church. Here are monuments of the Browne family, of Fenton (1603), who accompanied Froisher on his second and third voyages, and commanded the *Admiral* when the *Armada* sailed up the English Channel, and of George Shelvocke (1742), the circumnavigator. Sayes Court, so named from the Says who held the manor from 1191 until 1402, when it passed to Sir William Clinton, was pulled down in 1728; a workhouse was afterwards built on its site. A portion, about one acre and a-half, of the site of the garden wherein the Czar is reputed to have disported himself in strange fashion whilst at Deptford, in 1698, has been vested in trustees, and its maintenance provided for, by Mr. W. J. Evelyn; and having been laid out by the Kyrle Society and the Metropolitan Public Gardens Association, was opened eight years ago for the public enjoyment. It is perhaps worth noticing that Sir Richard Browne, who died at Sayes Court, was somewhat in advance

of his time, for he expressly enjoined that, for sanitary reasons, he should be buried outside the church, under the chancel south-east window.\* He had been our Minister to France, and gave the Trinity Corporation the land at Deptford on which they built the almshouses for seamen's widows.

IN the front of Messrs. Erard's new building in Great Marlborough-street, just completed from the designs of Mr. Percy Stone, there have been inserted a series of medalion heads in bronze, modelled by Miss Ruth Canton, whose work will be familiar to those of our readers who have been accustomed to take note of the contents of the Sculpture Room at the Royal Academy Exhibitions. High up on the building are the portraits of the two Erards, Pierre and Sebastian, and lower down (and therefore finished in a different manner, as being near the eye) are, on the left of the doorway, Beethoven, flanked on the left by Liszt and on the right by Thalberg (neither Beethoven nor Liszt would have enjoyed that, but we presume Thalberg was one of the players who preferred an Erard to any other piano), and on the right of the doorway is the bust of Mozart, with Spontini on the left and Schubert on the right. This also is rather an oddly-assorted trio, but that does not affect the sculpture, and we presume the choice was not the sculptor's. Miss Canton, we understand, went through a special course of study in this class of work two or three years ago, under the late M. Chapu, a better school could not be to study in, and her work does credit to her teaching. The medalions are executed in a golden-coloured bronze which harmonises very well with the colour of the brickwork. Over the doorway will presently be placed a group of Orpheus charming the beasts (not, we presume, with an Erard piano). The introduction of bronze sculpture in the front of a building, and in reference to the purpose of the building, is a precedent which we hope may be followed further. Sculptors, many of them, would be only too glad to have such opportunities often, and street architecture certainly benefits by such additions.

#### THE NEW GALLERY EXHIBITION.

It cannot be said that the New Gallery Exhibition is a very remarkable one; in fact, it is the poorest we have seen among the Spring exhibitions at this Gallery. Putting aside a few fine works, the bulk of the paintings are uninteresting, not so much from lack of interest in the subjects chosen—for it is a special tendency of exhibitors at the New Gallery to seek for subjects of rather out-of-the-way interest—as for the tame and ineffective manner in which many of them are treated. There is a want of robustness, an air of sentimentality of a rather weak kind, pervading the collection; and a good many exhibitors seem to be palpably trying experiments.

For the first time, we may observe, the traditional order of numbering has been broken through, and the numbers commence in the small south room instead of, as usual, in the west room. None of the important pictures of the year are here, however, we still go for these to the two large galleries. Mr. Alma Tadema's one contribution is an interior entitled "The Benediction" (163), a narrow upright painting which cuts a strip out of the interior of a Roman temple, where a priestess on the top of a flight of gilded steps holds two torches aloft; great part of the space is occupied by the "risers" of the steps; the half lengths of two girls coming away appear in the foreground, and the heads of others of the dismissed worshippers are seen in the rear, above the platform on which the priestess stands. The architecture, like the title of the picture, seems a curious mingling of Pagan and Christian associations, for a portion of an arch cuts across the top of the picture, and below is seen a portion of the perspective curve of an apse beyond it, as if it were a basilica, though the general feeling of the subject is frankly Pagan. The gilded staircase, and the roses strewn on it, and just showing above the edges of the steps, are splendidly painted, each flower being separately finished.

\* As Compton, Bishop of London, used to say, "The churchyard for the dead, the church for the living."

Mr. Watts's "Greek Idyll" (76) is not very Greek, it represents two or three seated nude figures grouped in a harmonious progression of lines and painted in warm, golden tones, with an assemblage of infants apparently all of the same age lying at their feet. In spite of the fine colour there is something that provokes a smile in it—a smile which the artist did not intend to raise. Sir E. Burne-Jones exhibits a repetition in oil (106) of his watercolour picture of "Love Among the Ruins" which was irreparably damaged by an accident of the oil-painting is richer and more powerful in effect than the original, but the picture, as we have already observed, is no representation of Browning's poem from which it takes its name. On the whole Sir E. Burne-Jones's best contribution is his beautiful and spiritual portrait of Miss Amy Gaskell (155), who indeed is made to look more like an ideal personage than a real lady of to-day. A small replica of the "Danae" (164) is another of the painter's contributions, and an ideal figure entitled "Vesperina Quies" (136), which does not interest us very much. Mr. Waterhouse's "Ophelia" (173) is a rather curious kind of experiment in a flat, half-decorative manner suggesting a design for tapestry, the profile figure seeming scarcely relieved from the pond landscape in the background; the conception of Ophelia is good, the work is a fine and unusual piece of colour. We have not noted any other figure pictures (apart from portrait) of any special success; Mr. Boughton's "Evangeline" (238) is pretty and characteristic. We cannot profess to understand what Mr. F. Brangwyn is driving at in his large and eccentric painting of "The Miraculous Draught of Fishes" (246). Mr. Nettleship's stalking lion, under the title of "Stealthy Fate" (237), is an animal-painting in his best style.

Among portraits, which are generally strong at the New Gallery, Professor Herkomer has one in a striking *bravura* manner (180), hung in the place occupied last year by Mr. Sargent's portrait of the lady in rose-coloured raiment, and perhaps intended as a kind of challenge to it; we hardly think successfully; but (like the other) it is a portrait every one must look at. The lady, who stands at full length (perhaps rather more, for the proportions of the figure seem abnormally tall), is clad in a boldly designed dress in which yellow is the predominating colour, and is relieved against a mass of crimson curtain. The whole effect is undoubtedly striking, but rather wanting in repose for a portrait. Mr. Shannon's portrait of Mrs. Charlesworth (207) in white dress is much more to our liking; that of Miss Jones, the head-mistress of the Notting Hill High School, (105) is also a very admirable and dignified portrait in more sober but effective and harmonious colouring; in both these, while the pictorial effect is good, the personality of the sitter is the chief interest; in Professor Herkomer's work we seem to think of the sitter only as the excuse for the painting of strongly coloured textiles. "Mrs. Charles Niven" (183) by Mr. C. W. Mitchell, is a very pleasing portrait picture, noteworthy for the effective and harmonious treatment of the colours of the costume and accessories. One of the most interesting and successful portraits in the Gallery is Mr. Watts's half length of the author of "Diana of the Cross-roads" (117), one of that type of portraits of which this artist has done so many, which are remarkable not for colour, effect, and accessories, but for the earnest study of character in the face.

The exhibition contains several fine landscapes. Mr. Alfred East's "Morning Sun" (181) is a large landscape showing a very careful and successful study of the effect of early morning light, and is one of the best landscapes he has yet produced, though it is surpassed by one in the Royal Academy which will be noticed in due course. Mr. Adrian Stokes, who has unfortunately not been able to finish anything for the Academy, sends two pictures, of which "Dawn" (184), is in his best style, but is not a work of the first importance as compared with others by the same painter which have been exhibited here. The large picture by Mr. Alfred Parsons, "A Lonely Farm" (210), is a very fine landscape, unusual both in composition, colour, and feeling, and is one of the best works in the gallery. There are various good landscapes on a smaller scale and signed by good names but not of very special interest, with the exception of two in the south room, "Late Autumn Afternoon, Whitby" (32), by Mr. W. Llewellyn, and "Sleeping Waters, St. Ives Bay" (36), by Mr. Moffat Lindner; this latter is a night picture. Both are of interest as successful treatment of special effects in nature.



among the sculpture exhibits in the hall, not numerous, is the late Miss Henrietta Talba's "Venetian Fisher Boy" (418), which seen at the Academy last year. The prominent works are Mr. Frampton's "Caprice," and Lucchesi's "Oblivion," both of which, if we are not, have been exhibited at the Academy. E. Roscoe Mullins has a very pretty little group "The Rising of the Dawn" (429). Mr. Pomeroy sends a group of three bas-relief panels (435) of abstract subjects, which are worth attention. Included among the sculpture subjects is a very pretty and fanciful lamp-holder by Miss Esther M. Moore, of a sense of the special capabilities of metal.

Among various smaller works in the balcony may notice a pretty fancy by Mr. Walter E. "In the Clouds" (255), and a rather variant study for a decorative representation of the Holy Family, by Mr. E. Fellowes Prynn, and according to an elaborate scheme of symbolism, of which the author has sent us a diagram or key, which however we have not time to follow here.

#### LETTER FROM PARIS.

On the opening of the two great Salons (of which on another occasion) has naturally distracted attention from the smaller exhibitions of which has been a constant succession for some time past. Among these, a word of special interest is due to the exhibition of M. Eugène Steinlen, who has a well-earned reputation as an artist. The interest of his exhibition resides in its great variety. Watercolours, pictures, designs for glass, advertisement posters, book illustrations, designs for embroidery, church ornaments, enamels, ironwork, mosaic, even architectural designs—M. Grassel can do something with all, and the 300 exhibits in his collection show a richness of imagination and an amount of technical knowledge really remarkable.

Steinlen, who is also an illustrative artist, collected in the Galerie du Théâtre d'Application a number of sketches and studies of the life of the lowest grade, delineated in an almost pathetic truth. One cannot but be struck by M. Steinlen's praise of great truthfulness of observation, but this realistic representation of the worst side of modern life is not very attractive.

It is a long step from there to the mystical positions with which the "Salon de la Rose" has opened what is called in the catalogue "troisième geste esthétique." The exhibition, according to its founder, at restoring "the ideal," with tradition for its basis and reality as its means." On this principle, there is no exclusion of historical painting, military or domestic scenes, representations of contemporary portraiture, landscape, genre, Orientalism, or painting or still life. Nothing is left to its bareness but allegory and legend, and therefore not surprising to find that the Salon de la Croix includes a very limited number of works, most of which are incomprehensible to many mortals. Hear and there, nevertheless, finds some interesting works, such as the "Pheus" of M. Deleville; the drawings by Knopff (evidently inspired by Burne-Jones); "Chanson d'Amore" and the "Sainter mes" of M. Osbert. These, however, are the few which might find a place in any exhibition, the rest are the production of mere amateurs.

The Artists Independants, who have had since the Pavillon de la Ville (which is being transformed into a Municipal Museum), have held their annual Salon in the Palais des Arts Beaux-Arts. As usual, there are a few clever and redeeming works may be noticed the landscapes of M. Duval-Gozlan, whose talent becomes year by year more remarkable, the portraits of M. Anquetin, the "Fauconnier Russ," of Cheremetev, the views on the Seine by M. Guillaux.

To finish with this list of the smaller exhibitions, we recommend all those who are interested in the history of Art to visit the exhibition of forty works of Manet in the Durand Ruel Gallery. It is an opportunity of seeing collected the best works of the artist who was the precursor of Impressionism twenty years ago, and whose art and power of manipulation at all events cannot be denied. The exhibition, which includes many well-known works, serves to illustrate the history of human judgment and the extent to which opinions and aims can be modified in the course of a few years.

A new artistic society has been formed with

the object of purchasing from the Salons the works of young painters and sculptors and disposing of them by lot among the subscribers. M. Léon Bourgeois, a former Minister of Fine Arts, is the President, and the society includes a great many names well known in art and literature, such as Alexandre Dumas, Roll, Pavis de Chavannes, Carolus Duran, Cormon, Robert-Flcury, Bartholdi, and Roty. It has taken the title of "Société Populaire des Beaux-Arts," and is expected to render great service in the encouragement of rising artists.

A great patriotic celebration in honour of Joan of Arc has just been held in Notre Dame, at which one of the spectacles has been the banner of the maiden warrior, restored according to historic data. It bears on its principal face a figure of Christ seated on clouds and giving his benediction to France, personified by two angels bearing fleur-de-lis. On the reverse is embroidered the scene of the annunciation, surmounted by the ancient escutcheon of France. Below this a dove, symbolising Hope, bears in its beak a scroll with the inscription "De par le Roy du Ciel." This banner, which is really a very fine work of art, has been executed after the design of M. Emile Ende, architect of the monument at Vaucouleurs, in collaboration with M. Emile Azambre, who designed the figures.

In this connexion we may mention the proposal of M. Fabre, a member of the Senate and an enthusiast about Joan of Arc, that the proposed new postage-stamp design should bear the head of that heroine in place of the symbolic head of the Republic and the commercial and industrial allegories which are at present in use in France, where an epoch cannot be characterised by the head of a reigning monarch.

An important group of scholastic buildings is shortly to be constructed in the XIIIth Arrondissement, the cost of which is to be defrayed by a legacy left by M. Ledru Rollin. It is proposed to make this the subject of a competition in order to obtain a model building, and to extract from the architectural profession some new ideas as to the construction and planning of buildings of this class, to be utilised in future erections also. According to the programme of the competition, which has been elaborated at great length by the Architectural Department of the Municipality, economy of construction is to be one of the decisive elements in determining the award.

The Municipality has also decided on the construction of a rope railway at Montmartre, 2,500 metres in length, which will start from Place Cadet and terminate at Rue de Poteau, on the north side of the hill, after having traversed Rues Cadet, Rochechouart, Clignancourt, Ramey, Hermel, and Place Ste. Euphrasie. The line, including the engine, will cost about 1,500,000 francs.

Speaking of Montmartre, it may be observed that the works at the church of the Sacré Cœur have been actively renewed with the fine weather. The external arches of the windows in the drum of the central dome have been commenced, and only a few courses remain to be built before arriving at the dome itself. The total cost of this great church up to the present date has amounted to 26,633,000 fr. It has already been mentioned in an article on the church in this journal, some time back, that besides the dome, M. Abadie's design included an immense campanile behind the apse. In this tower is now to be placed the bell which the City of Moscow was to present to the Cathedral of Paris in memory of the Franco-Russian fêtes. Its enormous weight rendered it unsafe as an addition to Notre Dame, and for the tower of Sacré Cœur M. Raulin, the present architect, has only consented to the introduction of the bell on the condition that it shall not be swung, but only struck with a hammer.

At the Louvre, M. Guillaume has commenced the works for the fitting up and arrangement of the long basement running parallel with the Seine under the main picture galleries, 150 metres in length. It is to be devoted partly to engraving and the exhibition of engravings, which latter will form a kind of illustration of the History of the Louvre.

On Friday last week, at Asnières, on the Place Voltaire, took place, with little ostentation, the inauguration of the monument created by public subscription to the late Durand Claye. The monument consists of a bronze bust on granite pedestal, and surmounted by an iron grille. M. A. Bouchier is the sculptor, and M. Trélat the architect. This inauguration, singularly enough, exactly coincided with the acceptance by Parliament of the complete principle of "tout à l'égout," of which Durand Claye was

the pioneer. The Chambers had just voted for the scheme of taking the Paris sewage to Achères, and it is to be hoped that it will soon be carried out now, and the sanitary improvement of Paris completed in this respect. The cost is estimated at 117 million francs.

The death is announced, at the age of seventy-five, of M. Isidor Victor Daumay, architect, who commenced his career as Inspector of Works at the Opéra Comique, when that building was commenced on the Place Favart in 1830. M. Daumay became subsequently engaged on buildings for the crown in connexion especially with the private property of Louis Philippe. In this quality also he co-operated in the construction of the flèche of the Sainte Chapelle. We owe to him some remarkable models of carpentry construction, now the property of the Ecole des Beaux-Arts. Among his other works were the Château de Bonneveau des Tourelles. He was a very conscientious architect, who had amassed a great deal of learning on subjects connected with his profession.

#### THE ARCHITECTURAL ASSOCIATION: MODERN HOUSE PLANNING.

THE ordinary fortnightly meeting of the members of the Architectural Association was held on the 27th ult., in the meeting-room of the Royal Institute of British Architects, 9, Conduit-street, Mr. E. W. Mountford (President) in the chair.

It was announced that a special visit had been arranged with Mr. Pearson, for Saturday, the 5th inst., to visit his new church at Maida Hill.

The President announced that the soirée would be held at the Holborn Town Hall instead of at Westminster Town Hall, on Friday, the 4th inst.

#### House List for 1894-5.

The House List for 1894-5 was then submitted as follows:—President, Mr. E. W. Mountford; Vice-Presidents, Messrs. A. C. Bulmer Booth and A. W. Earle; Committee, Messrs. S. B. Beale, A. Bolton, S. W. Cranfield, W. D. Caroe, A. O. Collard, F. R. Farrow, G. H. Sale, T. Moore, G. H. F. Prynn, E. A. Runtz, W. H. Seth-Smith, F. Waterhouse, E. Woodthorpe, Beresford Pite, Fleming, Huntly-Gordon, W. H. White, and H. A. Satchell; Hon. Treasurer, Mr. H. W. Pratt; Hon. Librarian, Mr. J. W. Stenhold; Hon. Secretaries, Messrs. F. T. W. Goldsmith and B. F. Fletcher; Hon. Assistant Librarians, Messrs. C. H. Freeman and E. W. M. Wonnacott; Hon. Auditors, Messrs. G. A. Lansdown and E. H. Sim; Assistant Secretary and Registrar, Mr. D. G. Driver.

The President read a letter from Mr. R. A. Briggs, expressing regret at his inability to be present through indisposition, and drawing attention to several of the plans exhibited on the screen.

Mr. F. T. W. Goldsmith (Hon. Secretary) then read the paper by Mr. Briggs on "London House Planning," which was as follows:—

When your Secretary honoured me by inviting me to read a Paper before you, and suggested that "Modern House Planning" should be the title of it, my first intention was to refuse, because I felt that I had nothing to say that would be worth saying, or of sufficient interest to you. But, remembering having listened some years ago to a paper read here by a gentleman now well-known in the first rank of the profession, and having been much impressed by several points he made and by the many "tips" his paper contained (which have since been of the greatest use to me), and after having met him, when he expressed surprise that I had been so much interested in what he had said, I bethought me that perhaps in a less degree, as I have studied deeply the question of house planning, something I may say may fall on the fallow mind of even one gentleman present, where it will, peradventure, fertilise and blossom forth and be the means of his creating something that the world has never seen before, and something that will revolutionise the whole domestic and social scheme of modern civilisation. The mouse you know was of great use to the lion, and I for the time will be the mouse.

When I began to consider what I should tell you about house planning, its difficulties, and what to plan and what to avoid, I found that it would be impossible to confine myself entirely to the plans, as the elevations, sections, details, and, indeed, the whole building, should grow in your head as you plan. Nothing should be left to chance, and, as you plan your building, you must have in your mind's eye not the lines you put on the paper, but the building itself as it will look when finished, with the lights and shadows, doors



and windows, full lights and cross lights, and, indeed, the completed building furnished and ready for occupation.

I have always found that the easiest method to start on planning a building is to draw it out, plans, elevation, sections, and perspective to a very tiny scale, such as 22 ft. to the inch, and I generally make these sketches in an ordinary architect's pocket-book, with the paper lined in squares. One can erase and alter very easily and quickly with such a small scale. Then, when I have the whole thing thought out, I begin to work out the building to 8th scale, when I, of course, put in all the details of the plan, &c.

This is only a suggestion to you by the way, but I commend the system to your notice for what it is worth, and we will now return to the subject of the paper. After the very interesting and deeply instructive paper which our learned professor—Professor Kerr—has read in another place on Town House Planning, and to which I have but little to add, I will confine my remarks to country and suburban house planning, particularly as I have had more experience in that class of house.

Let us start at the beginning.

A gentleman comes to one of us (I wish these gentlemen came more frequently) and wants us to design him a house. He has bought a plot of land which he considers admirable—beautiful views, near a station, gravel soil, water and gas laid on, and the land having a gradual slope to the south. Nothing could be better; an ideal site in every way. Well, what sort of a house does he want? what accommodation? what does he like? and last, though not least, how much will he spend? He answers these questions, and he probably impresses us with some point *he* considers most important—some crank, such as one as I remember a client once had when he came to me, and, in telling me what his requirements were, impressed upon me most seriously that he did not want any *licentious curves* about his house. Well, I did not want to give him any such wicked things; but I saw he had been reading Ruskin, which is a very good thing for all of us to do.

I never like a client to go too closely into the plan of the accommodation, as it is liable to hamper one, and influence one too much in looking impartially at the proper planning required. As long as a client gives me roughly the sizes of the rooms and their number, and generalises about their position, I am happy. One must, of course, "draw out" our client as to the style of the house he wants. Does he like the old Manor House style, with mullions and half-timber work, or does he want sash windows? His answer will be the "cue" to the whole building. If he likes mullion windows, tiled roofs, half-timber work, and lead lights, I know what he wants; but if, on the other hand, he says, "Oh, sash windows, of course, and good square rooms; none of your tit-bits and pokey windows and corners;" then I know my gentleman, and eighteenth century shall be his portion.

We have now a basis to go on, and we will take the house of the Manor House style first, although the general arrangements of the plan would not be affected even if we took the house with the square rooms first, as I shall presently show.

We will say our client wants a drawing-room, dining-room, library, hall, and kitchen offices on the ground floor, and about five or six bedrooms, bath-room, &c., on the first floor. We go down and see the land our friend has bought, and note on the plan of the ground the direction of the views, the falls in the ground, and the proposed position of the gardens, tennis-court, carriage-way, &c. And here I would interpolate that the public must be taught that the general arrangement of the gardens is distinctly an architect's duty. Why people should think that an architect's work stops short at the house I can never imagine. The public expect us to design the mantel-pieces, panellings, &c., in a house, and, then for no earthly reason that I can see, they wish us to hand over the finishings and furnishings of the house to some firm of decorators, and the garden, which is the setting and frame to the house, to the landscape gardener, so that he may work his sweet will in designing curving paths and flower-beds in the shape of pears, sausages, or any other atrocity that commends itself to his "fuzzy-wuzzy" brain. However, I hope that by degrees the public will understand that it is as much the duty of an architect to arrange the gardens and furnishings as it is for a painter to choose the frame for his picture. But to return to our plan, and to what nearly every one will take our advice about, and that is the position of the house.

Where it is possible, and I have generally found it so, it is best that the entrance front, with carriage drive, should be towards the north, so as to allow the garden front to be towards the south, in which front you will have your windows to the drawing-room, and to as many of the other reception rooms as you can. I would here, however, mention that it is never advisable to place your house directly north and south. It should be "tipped up," as it were, on plan, either towards the north-east angle or towards the north-west angle, so as to allow the sun to glint, at one part of the day, on the north side. The side of a house which never sees the sun is sure to be cold, and to cause the rooms to be cold also, and cheerless. My experience is that, in the east of England, you should "tip up" your house on the north-west angle, and in the west of England on the north-east angle, and then, when possible, arrange a belt of trees in the direction of the "tip," to shelter the house from the gales, which in the east of England would come from the east in most cases, and in the west of England from the west, as these heavy gales generally come from the sea. I have often noticed this small thing, which will show that we architects must have our eyes everywhere. In the east of England the trees slope to the west, whilst in the west of England they slope to the east, showing plainly from what quarter the heavy gales come. Therefore, when you are going to build a house in a new (to you) locality, see which way the trees slope and "look out for squalls," because on that side you must arrange there shall be the fewest number of windows, and mind you see that your walls are prepared for the squalls. Well, now as to the disposition of the rooms.

We start with our entrance, porch and vestibule, and do not cram them. There should always be a covered porch to a country-house, so that callers may be under cover whilst the servant is answering the bell, and it protects also the entrance door. There should also be a vestibule with folding doors to prevent the draught from the front door coming into the hall. In porches I have often noticed architects put seats, but I always think this is a work of supererogation, as I have never heard of callers at the present day being so tired that they could not wait till they were ushered into the house; and there are usually better positions to be found for seats for the inmates of the house. The details of the porch, vestibule, and hall should not be meagre. They are, as it were, the front-piece to the house, and a good impression on entering a house should always be contrived. A speculative builder, whose name I daresay many of you would know if I mentioned it, who had made his pile on rather small class houses, was once asked how he had been so successful, and his reply was: "Well, yer see, I always put a Corinthian cornice in the front portico." We do not want to copy our friend exactly, but without being snobbish, we can make our entrance look inviting. "Welcome the coming and speed the parting guest."

I always try and arrange that the hall can be used, if desired, as a room, and it is also very economical planning. And if you put it in the middle of the plan you can have nearly all your rooms opening into it and so save passages. Brillat de Savarin said: "A dinner without cheese is like a pretty woman with only one eye." Well, I think a house without a good hall is like a woman with no eyes at all. And remember that passages, except for the purpose of giving access to rooms, are all waste space. The problem therefore is to do away with as much passage space as possible. "A passage saved is a room gained," we may say. In the hall at one end you can put a bow window, and near it the fireplace, with a cosy seat, well out of the draught, and at the other end of the hall there would be the entrance and vestibule above referred to. The front door should not be far from the pantry and kitchen, so that the servant will not have far to come in answering the bell. Either in the hall, or just off of it, the principal staircase should be placed, and if possible it should be in such a position that people either going up or coming down the stairs are not in full view of the entrance door. Very effective features can be made of a staircase like this, as may be seen from the designs of many architects I could name. As a rule never cram the size of your staircase window.

Now let us take the pantry. The pantry must be near the kitchen and also near the dining-room. And as we do not want to know directly we come into the house in the evening what we are going to have for dinner, nor to let anyone who may happen to come into the house know that the dinner we are going to have will be stewed

steak and onions, the kitchen must be shut off by a lobby. What easier thing than to turn this lobby into a serving lobby, with a side hatch and double doors? This therefore must be the position of the kitchen, and the kitchen that the dining-room must be next this lobby, and thus we get the position of the dining-room. Again, as most people think of themselves as and as we have not got so far in England as to put our servants in better positions than ourselves, what more natural thing that we should place the dining-room towards the south and the kitchen, and, if necessary, the kitchen towards the north?

Now then about the kitchen offices, and fancy some one says, "But you have said nothing about the drawing-room and library?" True, my friend, I haven't. But if you are designing a house for a gentleman, and a gentleman has a wife, who is a housewife, betide the architect who has not arranged the kitchen offices properly! I remember designing a house for a lady and taking sketches to her, and before she had even seen the plans she said, "Where have you put the maid's closet?" Luckily I had not forgotten and had put it in a proper position, but believe me these little (apparently) matters are soul of a good plan. In the kitchen, considering this point, the position of the range, that it (1) shall have a good light on it, that the cook can see into her pots and pans, and (2) it shall be so placed that the smells can be taken up into a ventilator and not wafted through the serving-lobby into the house. A serving-lobby will prevent a part of the smells coming into the house, but care should be taken to prevent them getting even into the serving-lobby. My experience is that the best place for the range is opposite the door leading to the serving-lobby. The scullery will, of course, be immediately next the kitchen with direct communication. Then north of the scullery you will find your larder. The position of the larder is important. It must face the north.

Napoleon's answer, during his Russian campaign, to his officers when they were continually questioning him, was always the same, "North," so you, in your planning camps must remember—"larders north." Architects put their larders with communication from the kitchen, but I think the communication is much better from the scullery. Kitchens get hot, and hot air coming through the larder is not a good thing for the placed there. Larders should have lot ventilation, and I fancy the mistake many days is that architects make the windows small. I think a larder window should be smaller than 3 ft. by 1 ft. 6 in., at should have a sheet of perforated zinc in of glass. Directly out of the scullery, or immediately next it, the coal-cellar and servants' closet should be placed. I think the best arrangement for access to these is to have a covered You can, of course, let them open into the scullery but I think it is better they should have entrances into the kitchen yard or court. To much cleaner and sweeter arrangement. To scullery you will probably have your tradesmen entrance, arrange this so that the tradesmen not pass the servants' water-closet. As to cellars, I fear they do not receive the attention they deserve. People do not, I fancy, "down" wine as their grandfathers used, else they arrange that their wine merchants it for them. Anyhow, my experience has that only quite small wine-cellars are required in most cases they have been kept economical reasons (generally to save the expense of excavation) on the ground-floor. This is a bad arrangement if you put hollow walls round them, and the iron bins you can buy allow for a large quantity of wine to be stored in a very small compass.

We will now go back to the hall, and in going through it we must consider the ground-water-closet and lavatory. In every fair house there should be these apartments arranged on the ground floor, and they are difficult to arrange, as they should be out of the way, and at the same time easy of access, easy to find without showing too apparently they are. Where I often place them is in the landing and stairs, and if the walls are brick and the ceiling pugged and plastered, not think that any inconvenience is likely to arise from this arrangement. Where the misfortune has often been made is to put only a 14-in. partition to them; but if you put 4½-in. brick walls in cement in them, I do not think possible that anyone will herald his presence to the whole household when using the flush



cistern, which, as we know, certainly rings out its clarion note in a somewhat clear and aggressive manner.

Let us, however, pass on to the reception-rooms. We have already decided the position of the dining-room—at one end of the hall—not far from the entrance vestibule, which position was tied by the position of the pantry. A dining-room should be a parallelogram on plan, and it should not be too much cut up with bays and oriel, &c. These are for the drawing-room. The great points to consider in a dining-room are: (1) That it shall be wide enough for the servants to get easily round the table when the people are seated; (2) that the sideboard shall be close to the serving-lobby and door; (3) that the fireplace shall be far enough away from the table that the persons seated at table shall not be roasted during meals (an angle nook fireplace will obviate this in a narrow room); and (4) that if the window is at the end of the room and behind the end of the table, it shall not have a light in the middle, so that the host or hostess, or whoever is sitting at the end of the table, will be sitting in comparative darkness, and like the lady in Gilbert's opera, "might very well be taken for forty-two in the dusk with the light behind her." If you must have a window at the end of the dining-room, put a mullion in the middle of it, if a mullioned window, or put two windows with a pier in the middle, and then contrive a window on the side wall, we will say towards the east, to let the morning sun. I think the best arrangement however for lighting a dining-room is to put the windows on the long side of the wall and an extra subsidiary window in the end wall. Then our hostess will eat in comfort and bless you, her architect, that you have, with true gallantry, considered not only her comfort, but the proper sitting to her charms.

Well, now we come to the drawing-room. This, with the library, will probably be on the opposite side of the hall to the dining-room; and this is not a bad arrangement. A dining-room, after a meal has been served in it, ought to be aired, and it is not agreeable for people going in or coming out of the drawing-room to be running up against the servants either laying or clearing away the lunch or dinner "things." Besides, we still keep up the old fashion of going to dinner in procession. Alas, not many old fashions are kept up now-a-days, so let us preserve those we can; and the procession across the hall is a pretty sight, and reminds one of what the *monnaise* or the *minuet* used to be.

The position of the drawing-room and library will probably be south and west. Perhaps, too, the library will have a window towards north. It would, however, be better to keep the window towards the west. The drawing-room can well face the west as well as south, so as to get the sun for setting; and as a rule the drawing-room is not much used before the afternoon. In the drawing-room you can show off all your little t-bits, bows, oriel, bays, seats, &c. A drawing-room need not be, and is generally better for not being, a plain parallelogram. An L-shaped room is always cosier for a sitting-room, and besides, a room of this shape can be much more prettily furnished. If you cannot arrange the L-shape throw out a large bow window at one end or on one side, near the end of the room. A drawing-room may have many windows, only remember that there should be always a part of the room near the fireplace which will be well out of any draught from any window or door. The library will be probably next the drawing-room, and bear in mind that it will be necessary to arrange your windows and doors so that bookcases may be fitted up round the room. If your client's wife is a woman who has much "society," and gives dances, &c., you should arrange your library so that, by having sliding doors in the wall between the library and drawing-room, she can throw the two rooms into one, and make one big room for dances. In planning the drawing-room and library you should remember that the arrangement should be "telescopic"—either the drawing-room can be compressed into a snug boudoir or opened out into a large ball-room.

Now let us go up the stairs, and in designing stairs make the treads wide, and the risers low. The old, easy staircases we find in old houses used to be 6 ft. and 7 ft. wide, whilst their risers were never higher than 4½ in. or 5 in. What a difference to the narrow ladder staircases we find now-a-days!

On the first floor, in economical planning, the first thing to consider is the position of bath-room and water-closet. We must try and arrange the water-closet so that the soil-pipe shall enter the

drain where the principal ground floor water-closet does, so that the soil-pipe (and soil-pipes are expensive things) shall act as the ventilator. Therefore, the water-closet must be, if not over, nearly over, the water-closet to ground floor; and the best position for the bath-room is generally over the pantry. In any case it should be over some such office, so that in case of any overflow, the water does not ruin some expensive tapestry or paper in a reception-room. If you put the bath-room over the pantry, you can take your waste pipe to empty over the trap which takes the pantry sink. The bed-rooms will be disposed over the rooms you have arranged on the ground floor. When planning bed-rooms, three things should be borne in mind: First, that you do not want so much light (otherwise windows) in a bed-room as you do in a sitting-room. One window to each bed-room will generally be sufficient. Secondly, always draw when you plan the bed-rooms, the position of the bed, placing it well out of any draught from window or fireplace and door. And thirdly, always let your doors open, so that when open they hide the room. I generally try to arrange that for a sitting-room the door will be in the wall at right angles to the fireplace and at the furthest corner from the fireplace, whilst in a bed-room the door will be in the wall at right angles to the fireplace but at the nearest corner.

The cistern-room should be over the bath-room, and it should be easily got at.

As to cupboards. Some housewives are cracked about them, and would like to have them sprinkled about the house as they sprinkle their bows and ribbons. But beyond a housemaids' closet near the water-closet, and a linen closet near the bath-room, so that the hot-water pipes or cistern can keep the linen aired, I do not see the necessity of putting many cupboards about. There are, of course, the cupboards in kitchen, scullery, and store-rooms, but I think cupboards in bed-rooms are unsightly things, and that wardrobes are much more useful. This is a matter, however, in which you will be guided by your client.

Well now, gentlemen, we have discussed the general arrangements of a house and the disposition of the different rooms. The individual tastes and idiosyncracies of the client, and the exigencies of the site, will cause us sometimes, however, to alter in detail the positions of the rooms, but I think if we bear in mind the following points, where they will be possible, we shall not go far wrong in our plans:—

1. Have a good porch and hall, with the staircase not in full view of the entrance.
2. Have your pantry as near as possible to the entrance.
3. Have your dining-room and kitchen near your pantry and near each other.
4. If possible let all, or nearly all, your reception-rooms face the south; the kitchen and stairs and offices can then face the north.
5. Let your drawing-room be "telescopic," if possible.
6. Have your bath-room over your pantry.
7. Have as few passages as possible.

As to this last, which I would say is one of the most important, I would add this: Never skimp the width of your passages. Three inches is worth three times as much in a passage as in a room, whereas it would be very much felt in a passage; and I think the great problem in all house planning is to reduce as much as possible the necessity of passages, but where you have one, make it a wide one. No passage ought to be less than 3 ft. 9 in. Although we can copy (though not slavishly) the forms of the houses of the sixteenth, seventeenth, and eighteenth century, their quaint gables, bay windows, oriels, turrets, porches, &c., we must adapt them to our modern ideas of plans. We can assimilate their good points and expurgate their bad.

It was, therefore, a very interesting study for me, when a client who had lived in, and whose family had owned Bramhall Hall, asked me to design him a small house with the general outside appearance of that fine old mansion, but adapted to a modern plan. I am sorry the job is in abeyance, otherwise I would have liked to have shown you the working drawings, but perhaps from the photographs and sketches you will be able to see how I got over the difficulties.\*

Now let us consider the differences between designing a house for a client who likes these fine old houses, mullioned windows, oriels, &c., and designing a house for a client who wants sash windows and plain square rooms. In the one case you are not fettered; you can throw out a gable here, a gable there, and the more haphazard the

design, the more happy it seems to be. I have often felt that the backs and sides of some houses designed now-a-days are more interesting than the fronts, and I think it is because the irregularity has not been studied. Studied irregularity is never pleasing. It is a fraud, and frauds are always seen through even if they cannot be explained. Studied irregularity, on the other hand, if there is nothing incongruous in it, is pleasing. We admire the tact, the skill, and the thought that has been expended on it. But for goodness' sake do not let us go back to the times when, to conform to regularity, we have a staircase and landing with balusters showing through the middle of a window, so that the window-sill may be on the same level as the adjoining sills. If the sills must be on a level, it is bad planning, and if they need not be on a level, it is bad designing. As to the differences in plan between what I call the Manor House style and the eighteenth-century style, in a nutshell, I would say, where in the one style you have irregularity in the disposition of the rooms, in the other you have regularity. In the one style you may put your bays out of the centre of the rooms and where they happen to come. In the other style you must think out before you decide on the general disposition of the rooms where you will have your bays and porticoes.

The author then referred to a few plans of houses which have been built, and which he exhibited. With regard to No. 1, a house which was built at Stanmore, the plan, he said, was very similar to what he had suggested to them as a simple working plan for a simple small house. As to No. 1, the entrance was to the north-north-east; the drawing and dining-room front faced the south-south-west, and the road with the pretty views was to the south-west. The ground sloped to the south. They would see there was a window in the dining-room at the end of the room, but he arranged a small window in the west wall of the room. A sitting-room with only a window at the end was never very happy. Give it a side window as well and they got cross lights, which he always thought improved the appearance. The bow-window at the side of the drawing-room was arranged to do away with the stiff appearance a drawing, a parallelogram on plan, would give, and at the same time to get the rays of the setting sun.

As to No. 2, a house built at Northwood,\* the author said:—Many people have asked me the reason of the roof. Well, I will tell you. This house was designed with the closest regard to economy, and my client wanted stud walls covered with tiles for the first floor, as they would be cheaper than brick walls; but when I came to look at the by-laws of the local board I found that the walls must not be less than 9 in. As I wanted to help my client as much as I could, as every architect should his client, I thought "what could I do." And then the idea occurred to me. If I sloped my walls they are no longer walls, but the roof, and that accounts for the design.

No. 3 is a house founded on No. 2 with additions. Bays have been thrown out, the gables have been varied, and a room added on each floor.

No. 4 is the plan of a house built at Maidenhead,† and is very much on the lines I have suggested to you. The back staircase is placed in the position it is to give light to the kitchen passage.

No. 5 is the plan of a house that was built at Harrow, and I think the fault of this plan is that the kitchen and offices are on the opposite side of the hall to the dining-room, but I was tied as to these, because the garden entrance and drive had to be on the west side of the house, and as the best views were towards the south-west, advantage had to be taken so that the drawing-room should get these views. The billiard-room was also a room that my client considered of importance and desired to be placed in a good position. The plan of a central hall with an open passage round on the first floor is a good one, as it impresses one with the feelings of the great height and airiness of the house.

No. 6 is an enlarged edition, as it were, of No. 1. It was proposed that a billiard-room and a swimming-bath with bed-rooms over, should be added at some future date to the west end of the hall. A light at one end and the servants' staircase as near the other end as possible are to give thorough light to it.

This house will be placed very nearly due north and south, and the best views are due south.

This finishes my remarks, and I can only conclude by saying that it has given me very

\* Illustrated in the *Builder* for August 19, 1893.

\* See *Builder* for July 16, 1892.

† See *Builder* for July 8, 1893.



great pleasure in addressing them to you, and that if I can give anyone any further information it will afford me the liveliest satisfaction.

Mr. Francis Hooper, in proposing a vote of thanks to Mr. Briggs, expressed regret that that gentleman was not present, and he would, therefore, couple with the name of the writer of the paper that of the reader of it—Mr. Goldsmith. It seemed to him (the speaker) that the wisest course for an architect to adopt, who wanted to control the garden design, was to show it on his early sketches, and in that case the client was more likely to consult him when the planting was under consideration. Mr. Briggs made no allusion to the question of building materials, although that was an extremely important point, even if it did not come directly into the subject of planning. It seemed to him best to adopt local materials as far as possible, so that, if they were working in a brick district, they should use brick, and if in a stone district stone. They should all try to aim at perfection, and he would venture to say that a great deal of care ought to be taken with regard to details; the position of fireplaces must be carefully considered. There was a plan by a very distinguished architect hanging on the wall, in which one of the best rooms was spoiled by the situation of its fireplace, the fireside being rendered the least comfortable spot in the room. The position of windows too, again, was a matter of great importance, and every room should be treated separately and in consideration of its purpose. It was only repeating an old piece of advice to say that, in the planning of any room, they ought to indicate the furniture; very many bedrooms were spoiled by no definite position being allotted to the bed. In dealing with drawing-rooms and sitting-rooms, he was glad that Mr. Briggs had suggested windows to two walls, as this added much to the cheerfulness of the rooms. Where rooms communicated, and were of a certain size, it was pleasant to be able to pass from the dining-room into the library, and from the library into the drawing-room, without going into the hall. With regard to the height of rooms, it was of great importance to proportion the height to the area of the room. Few things were so unsatisfactory as a room unnecessarily high or too low. Where the architect was designing two rooms side by side, one a large room and another small, it was sometimes well to vary the levels of the floor. This treatment often gave an opportunity for a pleasing effect to an interior.

Mr. Bernard Dicksee, in seconding the resolution, said that if the garden entrance could be put in it should not be forgotten. He built a house some time ago in which the garden entrance was omitted so as to reduce the expense, but his client had regretted it ever since; and this was an essential point, especially where dogs were kept. He could not agree with Mr. Briggs with regard to his dining-room window. Mr. Briggs appeared to object to the window in the centre, but nothing was so pleasant in a dining-room as to have a window extending nearly the whole length of the room.

Mr. S. B. Beale supported the vote of thanks, and added that Mr. Briggs appeared to have exhausted the subject of planning modern houses. If he had omitted to mention the garden entrance it was perhaps from the fact that he considered it so obviously a necessity that he did not think it necessary to refer to it. They could not lose sight of the fact that Mr. Briggs was dealing with a particular kind of plan, in exhibiting the drawings that he did that evening. He should have liked to have heard something on the question of cost, because he believed Mr. Briggs had made a special feature of that, and in his charming little *brochure* there was a series of interesting designs of what were termed "bungalows," which he believed were done at a very low figure. Mr. Briggs had referred to the great originality of Mr. Belcher's designs, and that same quality, he thought, would always be associated with the name of Mr. Briggs.

Mr. C. H. Brodie remarked that Mr. Briggs had said that some women were crazy about cupboards, leaving one almost to believe that these were not a necessity in a house. Now, he had had the advantage of residing some time in a country where cupboards were considered a part of the design of every house. He could speak from experience of the advantage of having cupboards, not simply small ones alongside the fireplace, in which an ulcer could hardly hang, but where one could put a trunk or large portmanteau. If architects gave more attention to that matter, they would vastly improve the comfort of the house, and secure the goodwill of the guests, if they did not secure that of the man who paid for it. Mr. Beale had

referred to the cost of some of Mr. Briggs's houses, shown in his little book, and it would be interesting to have some further information on that point, especially from the person who made up the accounts.

Mr. B. F. Fletcher said that there were one or two points in the paper which he could hardly agree with. In designing anything he had found it hard to do so in a book of squares, ruled to one-eighth of an inch; he would rather advise them to design a house on the one-sixteenth scale on an ordinary piece of drawing-paper. In Kerr's "English Gentleman's House" there was a good note in which the different aspects were given. Another point in this class of house which always cropped up was the number of reception rooms, and Mr. Briggs seemed to take it for granted that it was necessary to have three. Most ladies wanted three reception rooms, but did not as a rule give enough space for them, and the best thing was to knock out one of them, and have two good rooms instead of three bad ones. As to angle fire-places, these were most objectionable things, as one never could get round them, although they looked well on the plan, and filled up an awkward corner occasionally. These bungalow houses did not touch the question of the ordinary London houses. For fresh ideas in planning he believed the most instructive thing that anybody could do, was to come up there once a month and run through the *American Journals*. In these they would find fresh ideas in the way of planning, more than would be found in any English architectural journal. Garden planning was always undertaken in America by the architect, who called in the landscape architect to help him with the general working out and lay of the ground. This made a great deal of difference in the general effect.

Mr. F. T. W. Goldsmith wished to echo the remarks of Mr. Brodie in regard to cupboards. He believed, not only in cupboards being in every room, but very large cupboards too. Mr. Fletcher had wondered how anybody could like an angle fireplace, but he knew many who liked these fireplaces. In fact, to his mind, there was only one decent place to put a fireplace, viz., in the corner of the room, and only those who had lived in a room with a carefully-designed angle fireplace knew the beauty and solid comfort of it. As to American house planning, they, in England, could hardly be expected to admire American things. They were Englishmen, with English habits and tastes, and with all its faults, they loved the English house best. The houses put up by Mr. Belcher and Mr. George, or the bungalows of Mr. Briggs, were just as comfortable as any American house.

The President, in putting the vote of thanks to the meeting, said that the first thing which struck one was the necessity of consulting one's client in regard to the style of the building, which showed what a wrong state of things existed at present. There ought to be only one style in which English houses could be built, but at the present moment there were many styles in use. Mr. Hooper had referred to the height of the rooms, and this was a most important point. The client, as a rule, wished his rooms to be much too high, thinking that they were healthier on that account, but this was a great mistake, and made the rooms ugly. For an ordinary house it was a mistake to make rooms over 10 ft. high, an opinion which he had formed after having a good deal of experience in such matters. He believed from an artistic point of view low rooms had a great advantage over high ones, and the same remark applied to corridors. He was struck that morning, in one of his own buildings, where, by force of circumstances, one floor had to be lower than the others, to find that it looked much the best. Another matter arising out of the height of rooms was a feature he had seen in Mr. Ernest George's houses, which had a very pretty effect. He had a large drawing-room, about 16 ft. high, with a spacious chimney corner, generally about 7 ft. in height, and over that chimney corner he got a sort of little boudoir, approached by a staircase in the angle of the room. This was a singularly pretty feature, and was of great use to the hostess.

Mr. Dicksee remarked that the same thing was done by Mr. Norman Shaw, in a house near Epsom.

The President, continuing, said that another matter on which Mr. Briggs seemed to be mistaken was the desirability of having folding doors between the library and the drawing-room, as this would spoil both apartments. If he lived in a house of the sort, he would not permit his library to be turned upside down for the sake of a dance, and, then again, if the whole of one side of the room

was to be occupied by folding doors, where were the books to be put? It was well to have the bed-rooms, if possible, with a more or less eastern aspect, as there was nothing like the light of the rising sun. There was no place where a seat was more pleasant and desirable than in a garden entrance. He agreed with Mr. Briggs as to the desirability of planning the furniture of a house, and that applied especially to bed-rooms.

The vote of thanks was then put and carried by acclamation, as was one to the several gentlemen who had lent plans and drawings.

The proceedings then terminated.

## THE ARCHITECTURAL ASSOCIATION SPRING VISITS:

ALL SAINTS' CHURCH, WEST DULWICH.

ON Saturday last a visit, arranged by Mr. B. F. Fletcher, Junior Hon. Sec. of the Architectural Association, was paid to the new church of All Saints, West Dulwich. The party were met at the church by Mr. Fellowes-Pryne, F.R.I.B.A., the architect, who had travelled up specially from Cornwall in order to meet the members.

The site slopes 28 ft. from west to east, which has given rise to some elaborate buttressing of the apse, round which a service passage 3 ft. wide has been carried on arches, connecting the buttresses, the morning chapel apse being treated in the same way. Below each of these apses is a chapel, while under the further portion of the site is a large Sunday-school. The nave floor is supported on girders and stanchions, and is formed of concrete. The foundations at the lower end of the site have been taken down 18 ft. below the school level, but in spite of all the expense involved, the cost of the church, when completed, will not exceed 7½ per sitting.

The plan is laid out on modern lines with a wide nave, 40 ft. between the piers and 65 ft. high to the under side of the wooden close-boarded ceiling. The materials used in the construction, both internally and externally, are Corsham Down stone and red bricks. The treatment of the chancel, always difficult to manage in connexion with wide naves without losing dignity, has been cleverly managed by placing a tower on piers, diamond-wise, at the junction of the nave and chancel on the north and south; by this means a view is obtained of the lady chapel altar from the nave, and also a view of the principal altar from the side chapel. The towers were designed to be carried up on each side of the nave, but, in consequence of expense, that on the north will only be carried up its full height.

Above the main arcade to the nave, space have been left for mosaic panels of the "Station of the Cross."

The chancel arch is fitted in with a stone tracery screen in a manner somewhat resembling the Lady Chapel at Gloucester, and is further treated with wrought ironwork bands, the centre one supporting the cross.

The Morning Chapel is very large, occupying the whole of the wide north aisle, and seating about 200 people. It is approached by external door and staircase, and has a sanctuary open to the chancel by arcades, and is vaulted in wood.

The choir is planned to accommodate sixty men and boys, which is further increased by a ladies' choir placed over the north choir aisle, and reached by a circular wooden staircase. The gallery will be also used for the instrumental music on occasions. The organ is placed over the south chancel aisle, and is well opened to the church by arches into the chancel and into the wide aisle on the south.

The chancel has been entirely completed, and has some admirable little statues of the Apostles, the method by which these were obtained, by making different sections of the congregation compete for the honour of giving them, being quaintly described by the Vicar, who accompanied the party.

A feature of the church is that everything in the shape of dossals, altar-hangings, and mats have been designed by the architect. The altar-table has an open-tracery front, behind which the frontals can be placed by means of an end access door, the framework being of oak, gilded and coloured. The heating is carried out by means of the high-pressure hot-water system, the pipes being 1½ in. internal diameter, and specially fitted with stop-cocks, so that portions may be warmed or wanted. The visit was one of the most instructive of the session, every point of construction and decoration being very kindly explained by Mr. Fellowes-Pryne.







THE ROYAL SOCIETY CONVER-  
SAZIONE.

THE exhibits at the conversation of the Royal Society, which was held at Burlington House on Wednesday, were not in general of much interest from an architect's point of view. Professor Norman Lockyer showed some detailed maps and plans which accompany the report on Nile reservoirs, recently published by the Egyptian Government. The exhibitor explained the various schemes brought forward as to suitable sites for the proposed reservoirs, and remarked that the one providing the construction of dams at Kalabshah, although probably more convenient than some others, was extremely difficult to carry out from the engineering standpoint by reason of the sandy nature of the ground. The scheme, already well-known to our readers, involving the submersion of Philæ and its temples, was said to be easy of execution, but Professor Lockyer observed that not only would Philæ be involved, but twelve temples would altogether be destroyed. He urged the necessity of a more complete survey before the adoption of any particular site.

Mr. R. E. Crompton exhibited some electrically heated soldering bits for soldering and brazing, composed of pieces of metal heated by a non-inductively wound or folded nickel steel wire, insulated and embedded in barium sulphate. On the same table was a potentiometer for measuring electromotive forces from 0.001 to 1,500 volts correctly to 1—2,000. An ink-recording pyrometer, consisting of a thermo-junction of platinum and platinum iridium attached to a dead-beat galvanometer was shown by Professor Roberts-Austen. The movable part of this instrument bears a fine lever with an ink pen, and the variations of temperature are recorded by a dotted line on paper coiled round a revolving cylinder. Another exhibit of a similar nature was by Mr. E. H. Griffiths, and consisted of long distance direct-reading electrical thermometers and pyrometers. These will undoubtedly prove of great practical value, for the indicator can be placed at any distance from the hot chamber, and any number of thermometers can be used with one indicator. The correct temperature can be obtained without calculation, whilst the readings of the instruments are independent of changes in the E.M.F. of the battery, of the temperature of the leads, and of the air. A very interesting object was an electric furnace shown by M. Henri Moissan, of Paris, which consisted of a block of limestone having a cavity cut in it. This cavity held a small crucible composed of a mixture of carbon and magnesia. The electrodes were made of hard carbon and passed through holes cut on either side of the surface, meeting within the cavity. A temperature of about 3,500 deg. C. may be produced; the metals are reduced by heating a mixture of their oxides with finely divided carbon, and for this purpose a current of about 600 amperes and 60 volts is employed. The Rev. F. J. Smith had a torsion ergometer or work-measuring machine, showing its use in connexion with a mechanical integrator, and as an electrical governor. Sir David Salomons exhibited apparatus for bringing out some new phenomena in vacuum tubes, by the application of alternate current. These experiments are pretty enough, and likely to attract the tyro, but they are getting rather too frequent at exhibitions of electrical appliances, and we should have thought that they were somewhat out of place at the Royal Society, where we not reminded that the Council of that august body are not so careful in selecting absolutely new things for exhibition as they used to be. A somewhat *dilettante* exhibit was that by Professor Silvanus Thompson, illustrating polyphase electric currents. Judging from the nature of the experiments carried out, the general impression left on the mind of the spectator was that the learned Professor had discovered a method of causing a half-a-crown piece to spin for hours without stopping—hardly up to the mark of what an exhibit at the Royal Society should be.

Mr. W. Worby Beaumont showed a vibromotor. The models illustrated a new mechanical motion which may be applied for actuating reciprocating machinery and for the prevention of vibration. Motion is either secured or prevented by the reaction of a rotating weight unsymmetric about its axis of rotation. The motion imparted being due to reaction is the precise equivalent of the work expended in forcing the weight to rotate on an axis not its mass axis. Though somewhat complex in theory, the apparatus in practice consists simply of an unbalanced rotating eccentric piece with supports on something free to move. Cranks and connecting-

rods are dispensed with. On the same stand were models illustrating the variation in vibratory amplitude in different parts of buildings due to the same vibratory influence. This apparatus for the "prevention of vibration," if it will do in practice all that is claimed for it, will confer an inestimable boon on users of machinery in large buildings.

The Pittler lathe, exhibited by Mr. W. von Pittler, is a machine tool upon which any and all kinds of ordinary and special turning, milling, machining, dividing, and wheel and scroll-cutting work can be executed under advantages hitherto not attained. It consists of a trapeze-bed with internal lead screw, a slide rest moveable and adjustable to any position provided with a grip-socket clamping upon a round saddle, and holding the T rest, slide-rest, and any of the numerous automatic attachments.

Mr. J. Theodore Bent sent some antiquities and anthropological objects collected in Hadramant, Southern Arabia, including inscriptions from the ruins of ancient cities. General Pitt Rivers had two models of the South Lodge Camp, Rushmore Park, Wilts, an entrenchment of the Bronze Age; also models of the Handley-hill entrenchment, near to which work the exhibitor believes is probably a British home-stead of the early Roman period. The pottery found in this last was both British and Roman-British; a denarius of Nero was found during the excavations. The twin-elliptic pendulum was exhibited by Mr. Joseph Gould. It is an instrument of simple construction for combining in one resultant figure the motions of two ellipses (or two isochronous pairs of harmonic vibrations) in the same plane. An endless variety of patterns and some rather pretty mechanical designs are produced. The most wonderful exhibit, perhaps, was the magnetarium for reproducing the phenomena of terrestrial magnetism and the secular changes in its horizontal and vertical components, by Mr. Henry Wilde. Mr. H. A. Fleuss had a mechanical pump for the rapid production of very high vacua; by its use experiments formerly occupying hours can be conducted in as many minutes.

Amongst the numerous other exhibits may be mentioned bathymetrical maps of the English Lakes by Dr. H. R. Mill and Mr. Edward Heawood; charts and sections showing temperature of parts of the North Sea, by Mr. H. N. Dickson; siphon recorder, Muirhead's artificial cable and automatic curb transmitter, by Dr. Alex. Muirhead; models of an improved method of communication between shore stations and lightships, by Mr. J. Wimsurth; specimens of "cotton xyloidin," by Dr. J. H. Cladstone; there was also the usual complement of natural history and medical objects.

THE INSTITUTE OF BUILDERS:  
ANNUAL DINNER.

THE annual dinner of the Institute of Builders was held on Wednesday evening last in the "Marble Salon" of the Grand Hotel, Charing Cross, the President, Mr. R. Neill, jun., of Manchester, in the chair. About sixty members and visitors sat down to table, amongst whom were Mr. J. W. Maclure, M.P., Colonel S. G. Bird, Mr. Andrew Murray, Surveyor to the City of London, Mr. W. H. White, Secretary to the Royal Institute of British Architects, Colonel Bridgford, Colonel Trollope, and Messrs. Leonard J. Maton, C. R. Gribble, W. Grimshaw, Archibald Neill, Jas. Kershaw, J. Howard Colls, J. Jackson, Henry Holloway, Basil P. Ellis, Joseph Kandall, John Bowen, T.P., S. Wheeler, W. Scrivener, E. J. Dove, H. Bartlett, Frank May, J.P., Wm. Shepherd, Thos. Hall, A. Bush, Geo. E. Codd, and R. S. Henshaw, Secretary.

The loyal and patriotic toasts having been proposed from the chair and duly honoured (the toast of the "Navy, Army, and Auxiliary Forces," being coupled with the name of Colonel Bridgford, who responded),

Mr. J. Howard Colls proposed, in humorous terms, the toast of "The Houses of Parliament."

Mr. J. W. Maclure, M.P., having replied, Mr. F. J. Dove next proposed "The Architects and Surveyors," coupled with the name of Mr. A. Murray. For a long time past, he said, the architects and builders had been discussing the question of contracts, and, with the exception of one clause, they were now pretty well agreed, and with regard to that clause, had it not been for one architect, an expert gentleman, it would have been settled long since. He (the speaker) hoped the question would soon be settled on equitable

terms, for architects then would be relieved of great deal of responsibility.

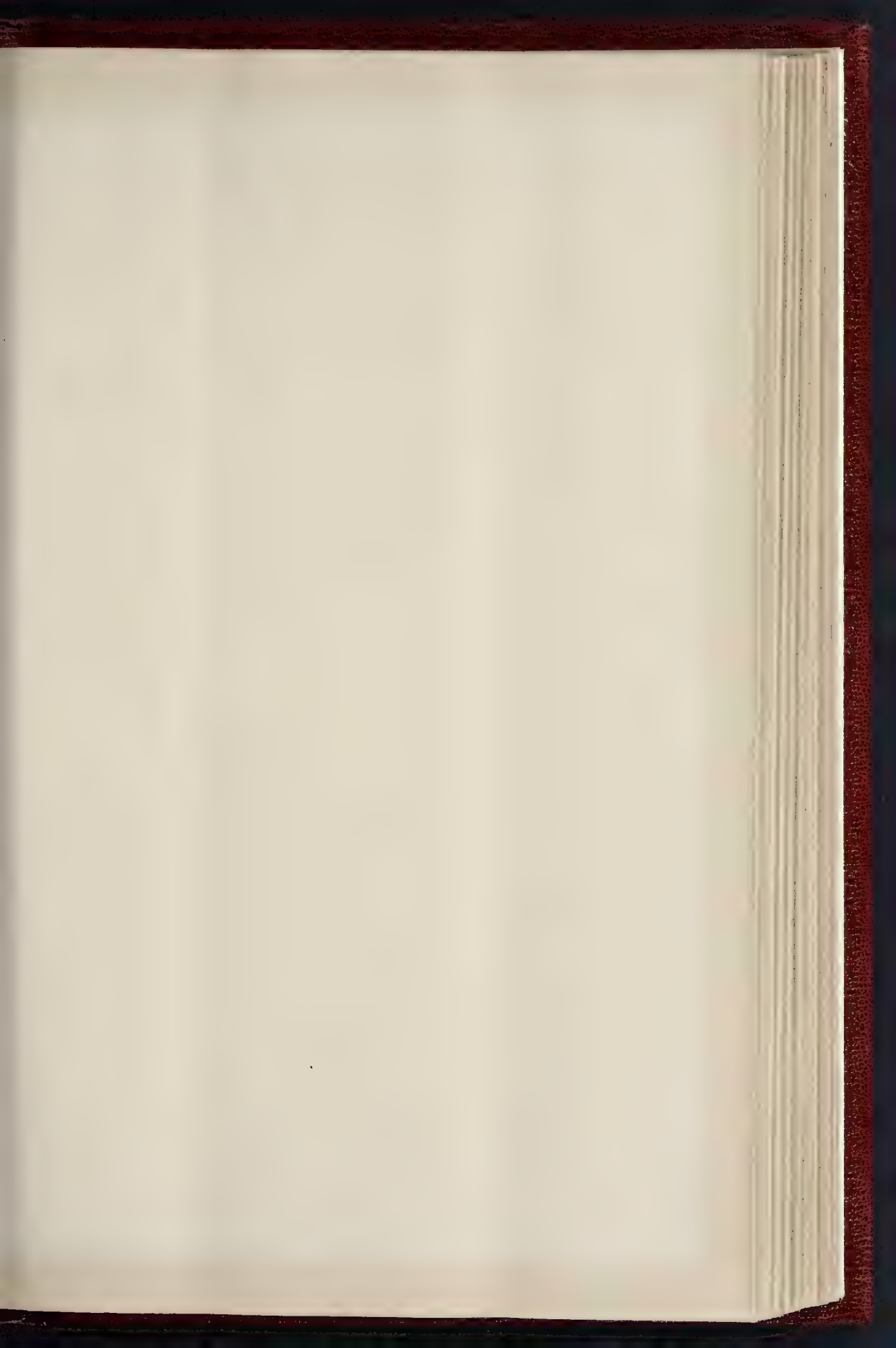
Mr. Murray, for the architects, and Captain Brown for the surveyors, briefly replied.

Colonel Bird then proposed the toast of the evening, "The Institute of Builders." He had, he said, undertaken to do so at the request of the President, who thought it better that the toast should be proposed by someone who knew more about the Institute than he did. As they might know, their Institute was started as the Builders' Society, and among other work which it did, in the days, was to arrange the form of contract which was in existence at the present time, and which they were now endeavouring to amend to suit the requirements of the present day. That society had done yeoman's service for the builders in past days, but it was thought desirable to form an Institute which should have some *locus standi* which the old society had not. One of the objects was to raise the standard and status of the building trade, and he thought that they had achieved some measure of success. What they desired was to make membership of their Institute a sort of blue ribbon of the trade, and that the fact of a man belonging to it should be a guarantee to architects and others that he was above reproach, and capable of carrying out good work. The building trade was one of the most important trades carried on in the country (there being no fewer than 3,000 engaged in the trade in London alone), and a position ought to be made for it, such as its importance deserved. The Institute began in a very small way, but was expanding, and he was glad to say that many builders of eminence in the provinces were joining them.

The President, in reply, said he was convinced that the Institute had been the means of conferring a great many benefits upon the building trade, and he and other contractors in the Provinces felt that the Institute was endeavouring to do good to the whole building community. Reference had been made to the County Council doing its own work: he might add that in his opinion that body could not build as cheaply as well as members of that Institute.

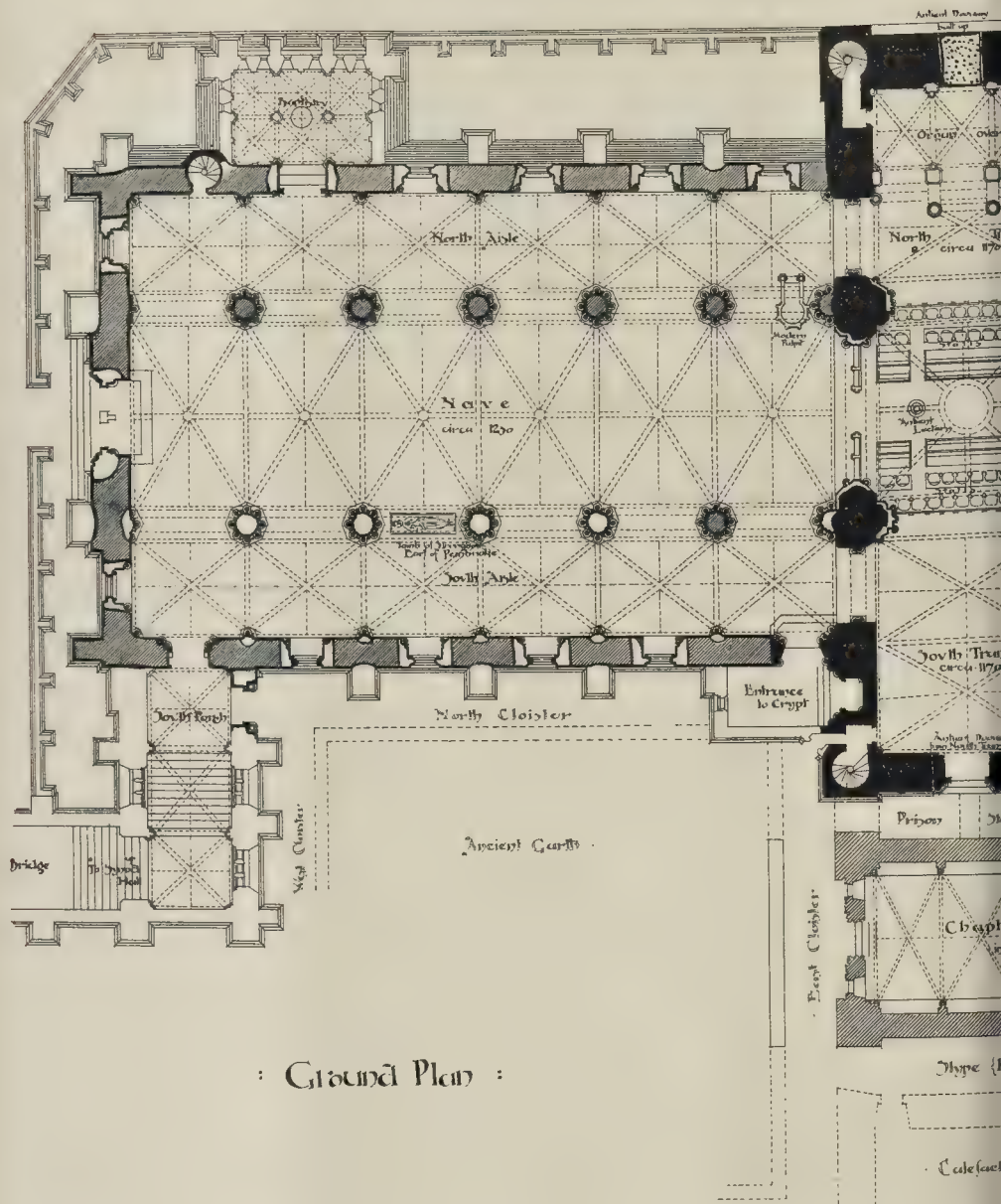
Mr. H. H. Bartlett next proposed the toast "The Visitors," coupled with the name of Mr. Young, who, in reply, said that builders appreciated good work better than anyone else, and perhaps, architects included. But it was not only architects and builders who were interested in building; the whole public was interested in good building. In past days, when building was to be carried out, the first thing done was to procure the best possible design; the next was to get the work done in the best possible manner; and the third, to get the work done at a fair and reasonable price. No man, no public body, ought to be expected to pay more than a fair and reasonable price, just as they had no right to pay less. Another system seemed to be working to-day. The first object was to get the cheapest possible plan, and the next was to get the work carried out in the cheapest possible manner. Could good building be done in that manner? He thought not. But the evil did not rest there for often, a year or so after the building was finished, signs of decay were noticeable, and the result was: committees of investigation at general recrimination, simply because our modern public bodies had the mistaken notion that cheapness was economy. Economy was cheapness, but it never followed that cheapness was economy. The proceedings soon after terminated.

ARCHITECTURAL ASSOCIATION. — DISCUSSION SECTION.—A meeting of the Discussion Section of the Association was held at 56, Great Marlborough Street, W., on the 2nd inst., when Mr. Max Cresswell, A.R.I.B.A., read a paper on "Architects' Work and 5 per cent." The discussion was opened by Mr. S. B. Beale, and was continued by Messrs. W. H. White, E. Greenop, H. A. Satchell, and the Chairman. Mr. Edwin T. Hall attended as special Visitor and summed up the discussion. The following officers were re-elected for the Session 1894-5: Chairman, Mr. W. H. White; Vice-Chairman, Mr. Herbert A. Satchell; Hon. Secretaries, Mr. William Pywell and Mr. Matthew Garbutt. SANITARY INSTITUTE CONGRESS, LIVERPOOL.—Dr. Thomas Stevenson, F.R.C.P., Scientific Analyst to the Home Office, will act as President of Section III. "Chemistry, Meteorology, and Geology," and Dr. Edward Klein, F.R.S., will be the President of Section I. "Sanitary Science and Preventive Medicine." Mr. A. M. Fowler, M.Inst.C.E., of Manchester, will act as President of the Conference of Municipal and County Engineers to be held in connexion with the Congress of the Sanitary Institute. The Congress is to be held in September next.

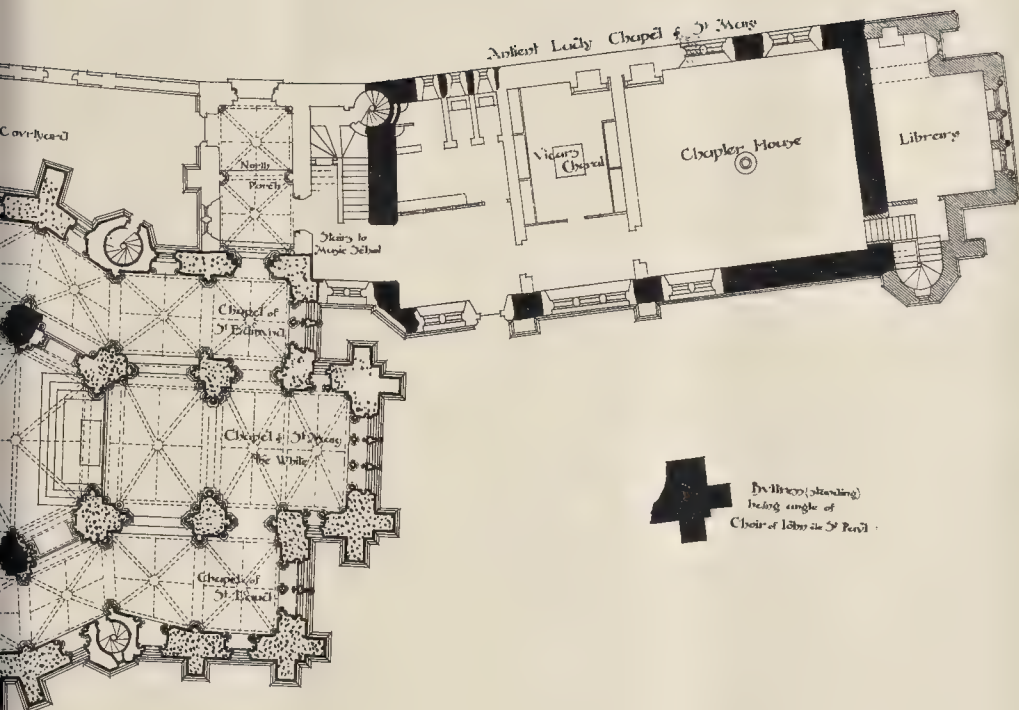




✦ Christ Church  
of the Holy Trinity ✦  
Dublin ✦



: Ground Plan :

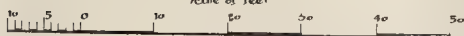


By the way (standing)  
holding angle of  
Choir of Lady de St Paul

#### Reference

12 <sup>th</sup> Century	
13 <sup>th</sup> Century	
Restored from evidence	
Restored on old foundations (1870)	
Modern	
New	

Scale of Feet



Fred G Hicks.

Delt 1894.

Chiefly from information kindly  
supplied by Thomas Drew Esq R.A.  
Diocesan Architect





THE LONDON COUNTY COUNCIL.

The usual weekly meeting of the London County Council was held on Tuesday afternoon at the County Hall, Spring-gardens, Mr. John Utton, the Chairman, presiding.

**Hanwell Asylum Improvements.**—The Asylums committee brought up the following adjourned report:—

"Hanwell Asylum, while it continues to bear a favourable comparison with its sister asylums as to health and recovery rates, is admittedly very defective in structural respects, more particularly as to ventilation and lighting, and its basement dormitories, which according to modern views are undesirable. Seeing that a large part of this institution has been in existence since 1831, this is hardly to be cause for surprise. Both our predecessors and ourselves have periodically given great attention to the matter, and we have recently adopted before us plans prepared by Mr. Clifford Smith, our engineer, and Mr. Ernest M. Martin, a resident engineer of the asylum, which, if adopted, we are of opinion will, at a comparatively small cost, effectually bring this old asylum into line with those of more recent date; and, while effecting the much-to-be-desired abolition of the greater part of the basement dormitories, will increase the total accommodation for patients from 1,900 to 2,000 beds—in itself a most important consideration, having regard to the want of asylum accommodation in London. Briefly, the scheme to abolish single rooms on one side of the building, where there are on both sides, and to convert the space thus gained into day-room accommodation, at the same time improving the ventilation. Dormitories will be built in the day-rooms for the patients so displaced, and, wherever possible, additional light will be afforded removal of internal walls and substitution of iron lattice-work. Annexes to the day-rooms will be built to contain the most modern sanitary, lavatory, and water-closet accommodation, and ward sculleries will also be provided. The remaining single rooms will be altered. Extensions and additional floors will be built to accommodate the patients displaced by the abolition of the dormitories in the basement. The approximate cost of these improvements is estimated at 35,000*l.*, and of the necessary furniture for the extensions, 2,000*l.* We propose that the work, to suit the asylum arrangements should be spread over three years, and that during the present financial year the sum 10,000*l.* (provided in the Money Bill estimates) shall not be exceeded. Having regard to the safety of the patients, and the proper working and discipline of the asylum, we think it necessary that the work should be carried out by our own staff of workmen, under the direction of the asylum's engineer. We recommend—

That, subject to an estimate being submitted to the Council by the Finance Committee as required by the Statute, and to the approval of the plans by the Secretary of State, the expenditure of 41,000*l.* be authorised for improving Hanwell Asylum, and providing the necessary furniture for the extra patients proposed to be accommodated.

After a short discussion the recommendation was agreed to.

**London Streets and Buildings Bill.**—Mr. Hubbard moved \* "That there solution of the Council of April 24, 1894, deciding not to withdraw from the London Streets and Buildings Bill paragraphs 3 and 5 of clause 175 relating to the cutting of wood and timber be rescinded; and that the paragraphs in question be withdrawn on the opponents of the clause giving an undertaking to withdraw their opposition." In the course of fifteen years there had only been fifty fires in road-yards in London, or an average of four per year, and he contended that it was not desirable that the resolution referred to should become law, as it did it would have the effect of dislocating the old trade.

Mr. Moss seconded.

Mr. John Burns, M.P., said that the paragraphs were the most important in the Bill, and he strongly opposed their withdrawal.

Mr. J. W. Benn, M.P., said the retention of the paragraphs in question would wreck what was otherwise a very good Bill.

After a long discussion the motion was carried 52 to 32.

The Council adjourned at 7 o'clock.

THE CHESTER SOCIETY OF NATURAL SCIENCE AND LITERATURE.

The annual meeting of this Society was held at the Grosvenor Museum, Chester, on the 26th ult., after which, at the request of the Society, Mr. Edward Robins, A.M.I.C.E., F.S.I., read a technical paper on "Scavenging and the disposal of House Refuse." The lecture was illustrated by diagrams and lantern slides. The lecturer gave an exhaustive description of the various processes for the collection and disposal of house refuse, and trade refuse.

COMPETITIONS.

**MEAT MARKET, BIRMINGHAM.**—The competitive designs for the new meat market in Bradford-street and Cheapside, Birmingham, were open to the inspection of members of the City Council on the 26th ult. The designs sent in by Messrs. Essex, Nichol, & Goodman, of Birmingham, have been placed first by the assessor; those by Messrs. J. A. Cossins & Peacock being placed second. The designs placed third were by Messrs. Bateman & Bateman, also of Birmingham.

**DARLINGTON MUNICIPAL BUILDINGS.**—A special meeting of the Darlington Town Council was held on the 27th ult., the Mayor (Councillor G. W. Bartlett) in the chair, to consider what steps should be taken with regard to the recommendation of the Markets and Fairs Committee that the necessary steps should be taken to proceed with the erection of new municipal buildings according to the first premiated plans. The Mayor said that in response to a three-fold request on the part of burgesses, property owners, and ratepayers to him, a town's meeting had been held, at which a resolution was passed almost unanimously that "in the opinion of this meeting it is not expedient at the present time to make the expenditure on the new Municipal Buildings contemplated by the Town Council." The minutes before them were those of the Markets and Fairs Committee that notice be at once given to the tenants occupying the buildings on the proposed site, and that such steps should be taken as were necessary to proceed with the erection of the new Municipal Buildings according to the first premiated design. Councillor Wallis said he might say that since the meeting held in the Central Hall he had consulted the Sub-Markets Committee, and the majority were in favour of not moving the resolution for the adoption of the committee's minutes. He would withdraw the minute. This concluded the business.

**BOARD SCHOOLS, LIVERPOOL.**—In response to advertisements inviting designs from architects for the new schools to be erected in Heyworth-street, Everton, by the Liverpool School Board, forty-six sets of drawings were submitted, all under motto. The Board, on the advice of Mr. E. R. Robson, Architect to the Education Department, who acted as professional assessor, have awarded the first place to the plans marked "Acme," by Mr. W. Rushworth, of London. The premium of twenty-five guineas for the second in order of merit goes to Mr. M. Treleven Reade, of Liverpool; and the fifteen guineas for third place is taken by Messrs. Butterworth & Duncan, of Rochdale. A special premium of ten guineas is to be given to Mr. W. J. Hale, of Sheffield, whose plans were placed fourth.

**HARTLEPOOL SCHOOL BOARD.**—In the competition for the Hart-road Schools, the assessor, Mr. Leeson, architect, of Newcastle, has awarded the first place to the designs of Mr. J. Mitchell Bottomley, architect, Middlesbrough and Leeds.

**CONSERVATIVE CLUB, SANDOWN.**—The committee of this club some months since advertised a competition for plans for a new club-house. Premiums were offered for the two best plans, and forty-three competitors sent in plans from all parts of the kingdom. The first premium was awarded to Mr. Edgar Hartley, of Eccles, near Manchester; and the second to Mr. F. H. Dancaster, of Boscombe, near Bournemouth. The work is being carried out by Mr. F. Colenutt, builder, of Sandown.

ARCHITECTURAL SOCIETIES.

**CARLISLE ARCHITECTURAL, ENGINEERING, AND SURVEYING ASSOCIATION.**—On the 25th ult., in the Town Hall, Carlisle, the third session of this Association was brought to a conclusion by a paper on "Girder Works and Strains," delivered by Mr. W. Howard-Smith, A.M.Inst.C.E., City Surveyor. The lecturer commenced by giving simple definitions of the meaning of the words strain, stress, moment of rupture, shearing stress, moment of resistance, &c.; then by a large number of coloured diagrams showing girders, beams, and cantilevers loaded in various ways, and the methods of ascertaining the strains at the various parts mathematically and graphically, he explained all the necessary formulae to be considered in calculating the amount of material required for girders of various sections to bear the strains at the different points. The importance of considering wind pressure in calculating for the strength of large span bridges was touched upon, and the nature of the special bracing to be provided. The paper also dealt with the ultimate resistance of steel and iron to tensional or com-

pressive strains, the effect of punching and drilling holes through iron and steel plates, and the different systems of parallel and chain rivetting. Drawings were shown and explained of rocker and roller bearings for the expansion and contraction of large girders.

ENGINEERING SOCIETIES.

**THE INSTITUTION OF CIVIL ENGINEERS.**—At the meeting of the Institution of Civil Engineers on the 1st inst., Mr. Alfred Giles, President, in the chair, the paper read was on "The Manufacture of Briquette Fuel," by Mr. William Colquhoun, Assoc.M.Inst.C.E.

**CIVIL AND MECHANICAL ENGINEERS' SOCIETY.**—On the 26th ult. a paper was read before this society by Mr. A. J. Emery on "Steam Pumping Machinery for Waterworks." After dealing with the general principles underlying waterworks service, a general description of some of the most notable specimens of engines for this service followed. The Cornish engines, the merits of and objections to which were discussed, were first referred to as being the earliest class of large pumping engines designed for water supply. A review of fly-wheel engines followed with a description of a few of these and a synopsis of some tests. The gist of the paper, however, lay in the latter part, in which the Worthington high duty attachment to duplex direct acting pumps was explained, its action on the plungers being shown by the aid of diagrams. It was also shown how, in a fly-wheel engine, as the speed of the engine decreases the duty rapidly falls, while with the high duty attachment mentioned the economy is independent of the speed and load on the engine. Following this, several examples of Worthington pumping machinery were noted and extracts given from tests of some of the more prominent engines of this class. It was also stated that about 70 per cent. of all the water from the Thames used in the Metropolis is now being pumped by Worthington direct acting duplex pumping engines.

Illustrations.

CHRISTCHURCH OR CATHEDRAL OF THE HOLY TRINITY, DUBLIN.\*

BY THOMAS DREW, R.I.A.

IN perambulating the cities of the kingdom to make an exhaustive record of their ancient Cathedrals in the *Builder* Cathedral Series, the recorder finds a unique position in the City and See of Dublin possessed of two ancient Cathedrals, one intra-mural and one extra-mural. The architectural style of both which remains on evidence would indicate to the architectural student contemporaneous erection in the beginning of the thirteenth century. Those who study these two churches more closely will find that they are so absolutely unlike in every characteristic of plan and details, that they might be imagined to be cathedrals of two different lands separated by seas. Where two cathedrals are found, like two rulers or two rival beauties in one community, it follows that each must have its train of adherents and admirers. It has naturally been so in Dublin City throughout six and a half centuries. The local contention for pre-eminence is as old as St. Patrick's Cathedral itself. The ample store of records which Christchurch possesses of the *querule* of the two churches, in the original bulls of Popes and solemn deeds of submission, are of record that the older foundation maintained its position and precedence as the mother church.

The *Builder* series has taken first in order of illustration the extra-mural Church of St. Patrick as the larger, statelier, and more popularly-known out of Dublin of the two churches. The very incident of its identification with the life and career of Swift has made it a widely-known church of the world beyond Dublin.

St. Patrick's owes its existence, as has been explained in a preceding article, to the individual effort of two Anglo-Norman prelates introduced

\* The series of the "Ancient Cathedrals of Ireland," which was begun in our issue of April 7, will be continued in the first number of each month, until June next. Particulars of this and of the "English and Welsh" and of the "Scottish" series will be found on page 360. The series of illustrations of the "Abbeys of Great Britain" will be resumed in July next. No. 1 "Westminster," was given in our New Year's number, January 6, 1894.

\* See last week's *Builder*, page 330.



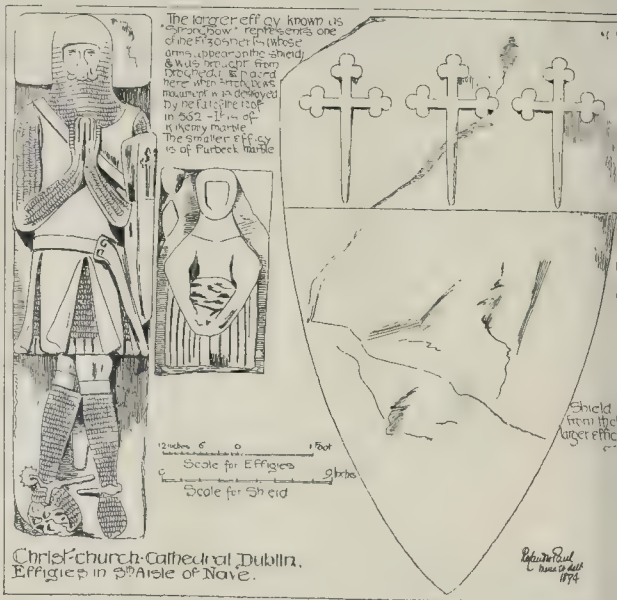
into the See of Dublin. John Comyn and Henry de Loundres (1190-1228) desired to supersede the ancient cathedral foundation which they found there with its native monastic and independent Chapter, at that time distasteful to all Anglo-Norman bishops. It was evidently their design that the old foundation, with its unruly community of Danes, Celts, and earlier Anglo-Norman adventurers, should die out; but it did not do so, and it maintains its existence as the metropolitan cathedral of the diocese of Dublin, with its distinctive Danish Constitution of 1038 to the present day.

St. Patrick's, if small things may be compared with great, is, like Salisbury, a church of one period. Its symmetrical plan and the ordinary Early English details of ancient work that survive are soon understood and its interest for the architectural student exhausted. Christchurch, on the other hand, with its more ancient origin and fuller records, its strange and unique plan, its evidence of growth through the centuries, and its elaborate and curious architectural details, is full of abounding surprises, and will arrest the interest of the student visitor longer than the greater and stater sister church.

Christchurch of the Holy Trinity, as it should be properly called, has earliest interest in the fact that it is the only known church of Danish foundation in the kingdom, and that the rude Danish building is incorporated in it, and survives. Dublin was exclusively a stronghold of Danes for 300 years up to 1014, when a decisive battle at Clontarf, near Dublin, broke their power, and thenceforward their history is that the Scandinavian colonists merged gradually among the native population. The Christianised local king of Dublin, Sigtryg Silkbeard, and a Danish Bishop Donat founded a cathedral (*Christchurch* in Scandinavian speech) A.D. 1038. "Divers men coming out of England," says an obscure record of the Church, "found there certain *fornicie sive volte*." This, read by the remaining church, means that the Anglo-Norman adventurers, Earl Pembroke, called Strongbow, and his south-west of England comrades in the first English invasion of Ireland, found Sitric's rude vaulted church in existence, as they did at Waterford a similar Danish church built by Sitric's cousin Harald, which survived until 1770. After long and careful study of various evidence, which could not be entered on in the compass of this article, the writer of it has the assured belief that in the rude crypt of Dublin Christchurch is found the complete and practically unaltered church of Sitric, save that the Anglo-Normans, finding it there a century and a-half later, removed the *volte*, introduced rows of intermediate piers up the centre of the nave and transepts, and re-vaulted it to form a level floor for the upper church which they built above it.

The plan is a peculiar one, and compared with one resembling it—that of the Cathedral of Trondhjem—seems to tend eastwards to a chapel, or *sefirium*, a depository for relics, a distinctive Scandinavian ecclesiastical taste borne out by the long store of Christchurch relics found in its records.

On lines of the ancient Church of Sitric, Strongbow, and the famous Celtic Archbishop St. Lawrence O'Toole, whom he found in the See of Dublin, proceeded to found a Transitional Norman Church, A.D. 1170; and what gives unique character to the plan is that it is a bold design conceived to stand on the old one; no other theory is possible to account for a queer plan, which is neither apsidal, nor yet square-ended, and yet a combination of both. Three square-ended Eastern chapels were built over those below, and towards the central one the sides of the choir tend with two short cants. Eastward of the choir, it should be understood, the upper Eastern chapels are a restoration of Mr. Street's above their foundations, but on ancient lines, with unmistakable evidence to go on—re-building, conceived in the happiest abnegation of the spirit of Street; so inspired by the *genius loci* that by familiarity one ceases to regard these singularly beautiful chapels as modern work. Elsewhere throughout the interior of this church so much ancient work remains or the evidence on which it has been replaced so conservatively and conscientiously by Mr. Street was so definite, that now the most skilled analyst would fail to find where antiquity ends and restoration begins. In the modern furnishing and fitting of the church only is the hand of Street in evidence. Otherwise there is such a consistent and genuine restoration that the church can be studied with satisfaction (external features excepted) as a curious eleventh and twelfth century church of abounding interest. Its magnificent



floor alone, a good reproduction from the extensive patches of ancient tiling found by Mr. Street, is an unequalled example for study of what a grand scheme of pavement design may have been when such existed in perfection in the thirteenth century.

Strongbow, Raymond-le-Gros, and Fitzstephen coming out of South-west England and bringing over their countrymen builders from the school of Glastonbury and Wells, who left characteristic traces of their handiwork *en route* at St. David's, Valle-Crucis, Strata-Florida, &c., began this church. The powerful Celtic Bishop Lawrence, a man of culture and learning beyond his contemporary fellow countrymen, either took kindly to the improved style of architecture and church ordering of the English invaders or was prudent enough to see that fighting with them was a lost game in the long run. With apparent cordiality he joined them in the foundation of the new English church and let "the rest keep fighting." They built, as the Black Book of the cathedral records, the choir and aisles (*i.e.*, the transepts), and three chapels, one dedicated to St. Mary the White, one to St. Laud, and one to St. Edmund, king and martyr. There also stood near it (it does not say, however, that these founders built it), a chapel dedicated to St. Laurence O'Toole. It is likely that the little chapel of the south transept, re-built by Mr. Street, was built subsequent to the canonization of St. Lawrence, and that Mr. Street's problematical restoration in twelfth-century dress is an anachronism.

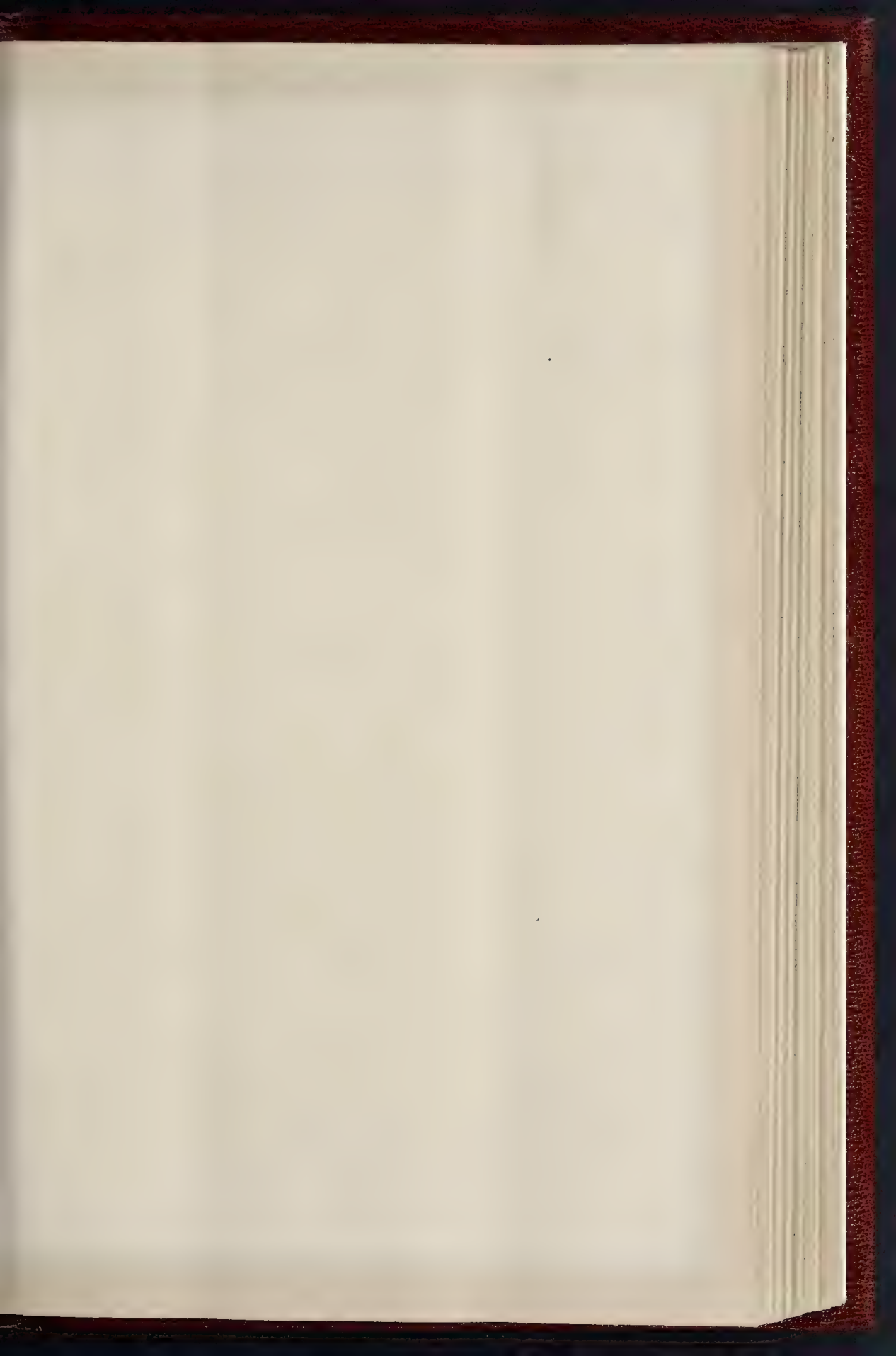
The progress of raising the Anglo-Norman upper church on the Danish crypt was interrupted by the death of Archbishop Lawrence of Tuathal, who left his see on a mission to Rome in 1179, and died at Auge or Eu, in Normandy, according to Ware, in 1180, where his memory is still perpetuated by a church dedicated to him. It was stated in the account of St. Patrick's that John Comyn and Henry de Loundres, his successors, let the building work at Christchurch and its Arroasian Canons severely alone, and it is evident that building was resumed under Archbishop Luke about 1230. The nave was then built in fully developed lancet style and with great refinement of detail and design. It is as evident, as in the original Transitional twelfth-century work of the choir and transepts, the builders came from the original Glastonbury school; the stone used is without doubt a Somersetshire oolite and the shafts freely used are Purbeck. A curious circumstance to be noted is that the stonework, when examined, for the most part resolves itself into uniform scantlings of 2 ft. by 1 ft. by 1 ft., while the hundreds of shaftlets of Purbeck used were of a uniform length of 16½ in. each, and the mouldings seem to have

been designed to suit the scantlings of the stone. It points to importation of seaborne "scantling" as deals come to us now, which influence moulding and design of the work. For instance, the many-annuletted nook shafts are a distinctive feature of Christchurch work, and, while plain and effective, they seem to indicate jambs made of so many 16½-in. lengths of Purbeck shafts so many annulettes, an annulette of like doing duty for a capital at the springing.

On September 18, 1235, the king gave leave to the Prior and brethren of the Trinity to close up an ancient highway to the west end to lengthen their church. This factually dates the work. The westernmost end and bay of the north side confirms the record. It is differently moulded and has no sculptured capitals—the skillful carvers who left so cunning work in the Dublin Church had gone back to Somersetshire or Pembroke. There is also no crypt below the western end which was tacked on.

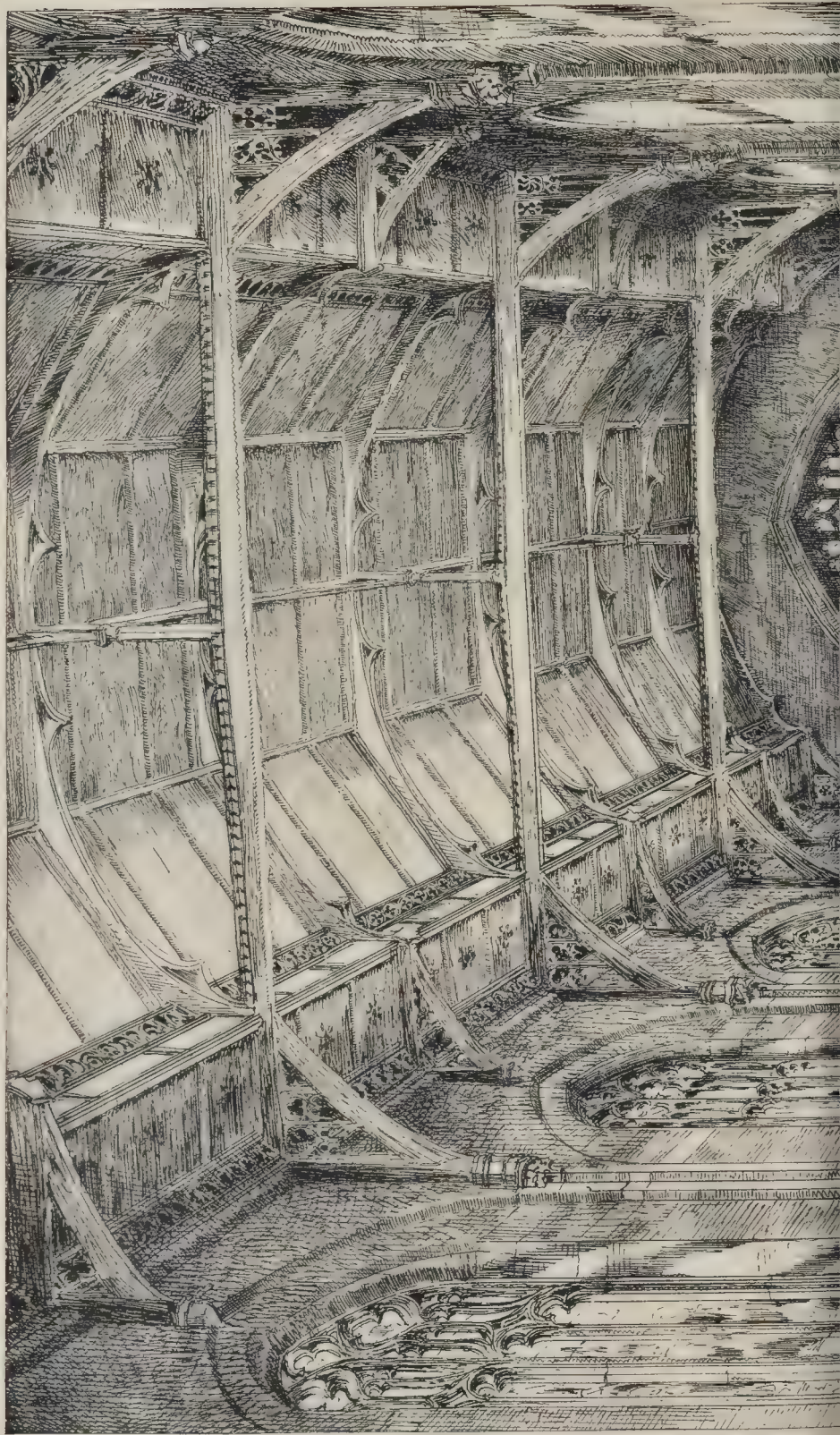
This beautiful work of the nave came to disaster by the "fall of the rofe and body of Christes Church" in Queen Elizabeth's time, as an inscription on the wall, by Sir I. Sydney, the Lord Deputy, records; and another inscription he states that "this was done," which is more Irish than accurate. The church all stands over a peat bog. After the rains the bog slipped on the sloping hill. The groined roof fell in, thrusting out the side of the triforium 2 ft., and ruining the side. The debris of the roof lay there 3 ft. and was flagged over, covering the ancient monument, until Mr. Street cleared it out. Lord H. Sydney built up the north side in a plain face of wall with but two arches in it, and propped the north side with beams of massy oak. It stood until the restoration begun in 1870. Mr. Street had to work on was the north side, shabby, but all there, and on the south side. H. Sydney's wall, in which were embedded of the shattered arcade piers. There was manner of doubt left, or fancy to be exercised in restoration. He repaired and replaced, leaving the nave nearly as satisfactory a complete and authentic specimen of interesting thirteenth-century work as could be found.

About 1360 another disaster befel Christchurch. John de St. Paul, a barbarous bishop, fired rivalry of that other cathedral under his nose. It was, just outside St. Nicholas' Gate, determined to enlarge his choir and have as many Arroasian to his to sing complines and matins as they had seculars at the other place. He ruthlessly pulled down the quasi-apse and the chapels of St. Maria Alba, St. Laud, and St. Edmund to make a long choir. There stood to the north-east a detached chapel of the Blessed Virgin Mary, probably of Danish foundation, which exists in





THE BUILDER, MAY 5, 1894.





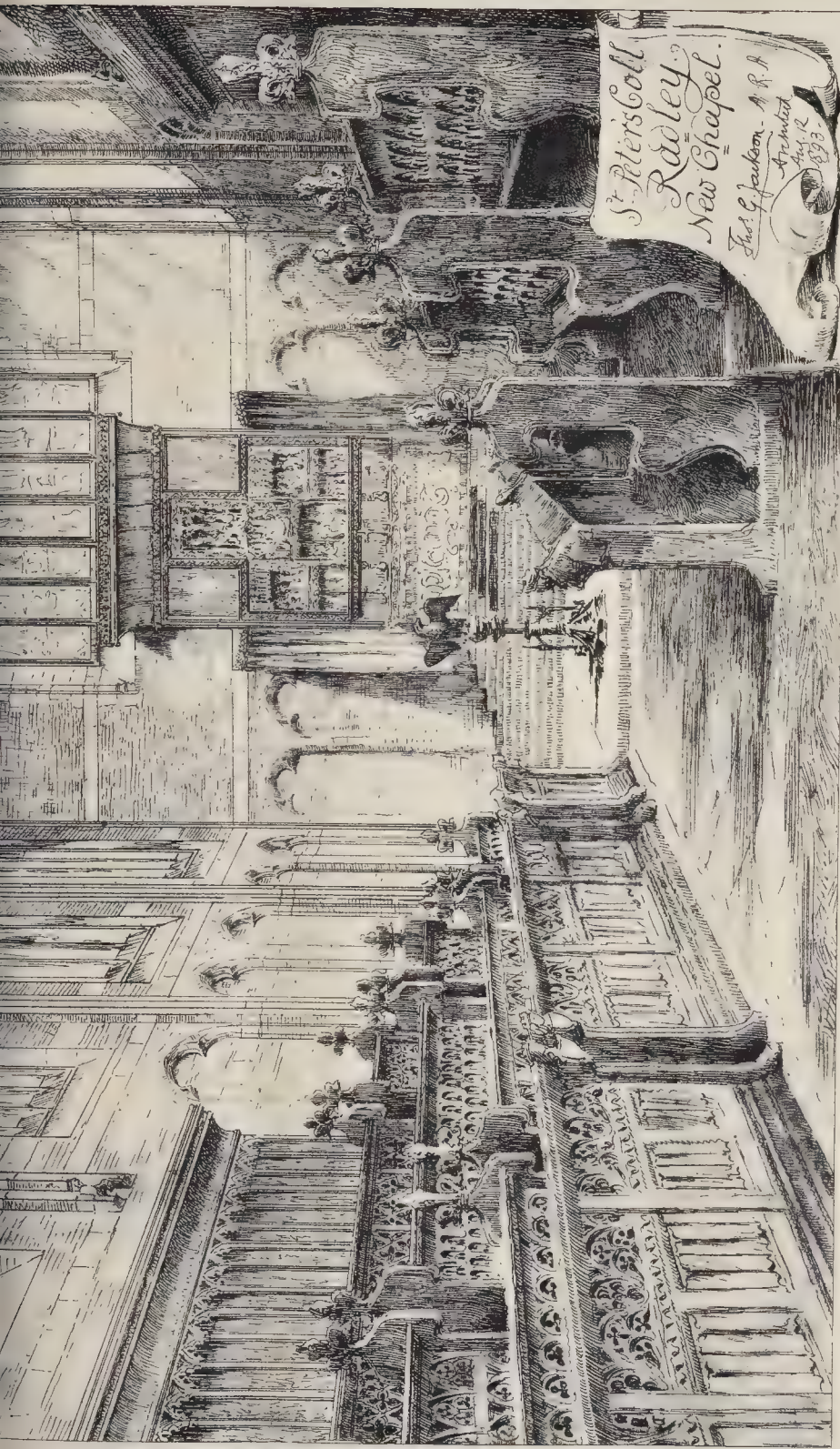
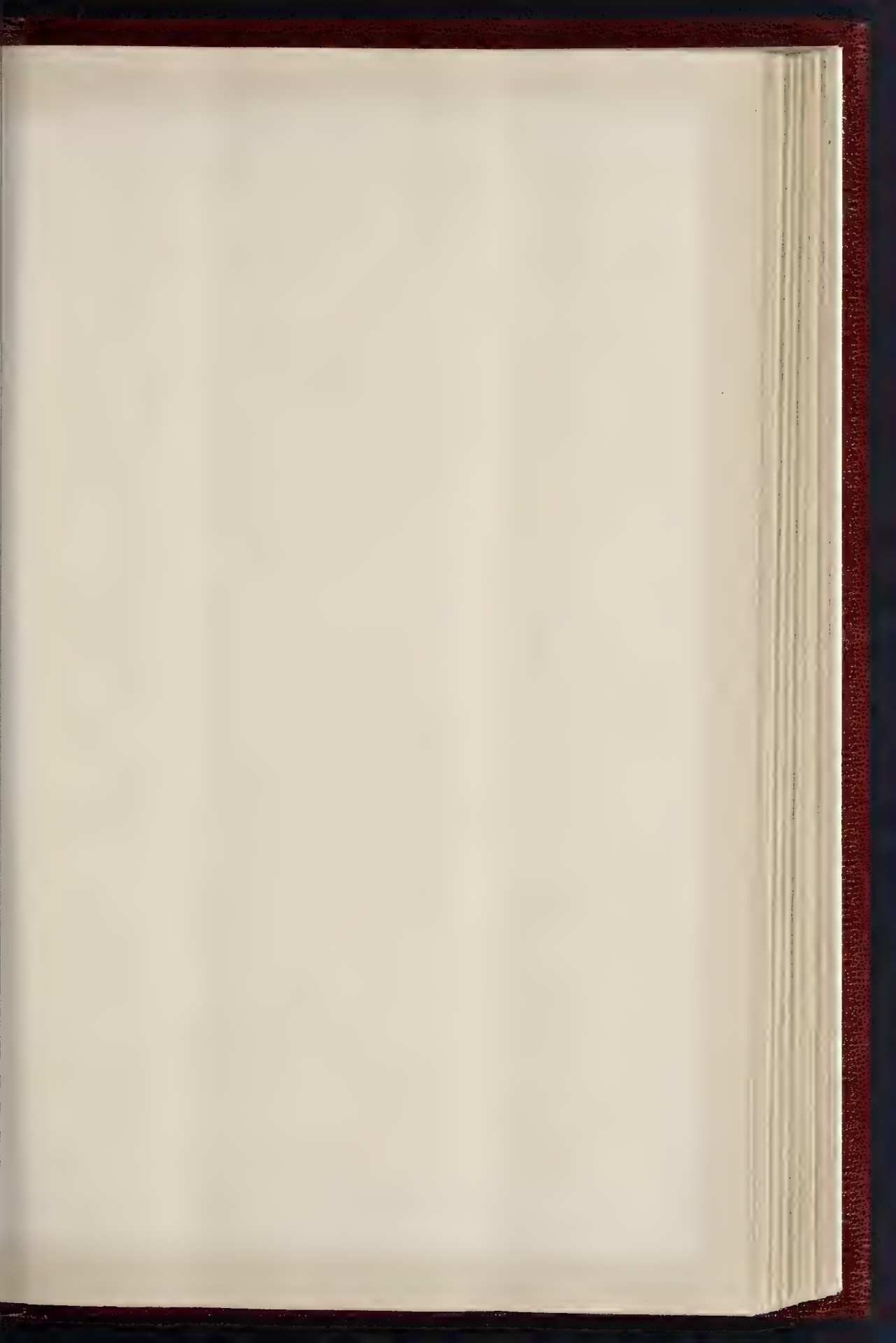


PHOTO SPRAQUE & CO. 48, REGENT STREET, LONDON, W. 1.









# SMALL COUNTRY HOUSES

See Northbrook and Mansfield, also pages 100 and 101



Peppercorn, Northbrook House  
By Mansfield, George and Mansfield, 1894



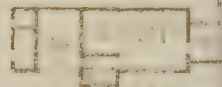
By Arthur Mansfield  
"The House" - Mansfield - 1894  
By H. Mansfield, Mansfield, 1894



Order no. 1894  
By Mansfield, Mansfield, 1894



By Mansfield, Mansfield, 1894



SMALL COUNTRY HOUSES

Field Harrow  
F. G. G. G. G. G.



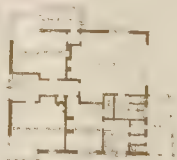
House "Howls" (also known as "Howls")  
for "Howls" (also known as "Howls")



Kenne Harrow  
for Arthur J. Hill (G. G.)



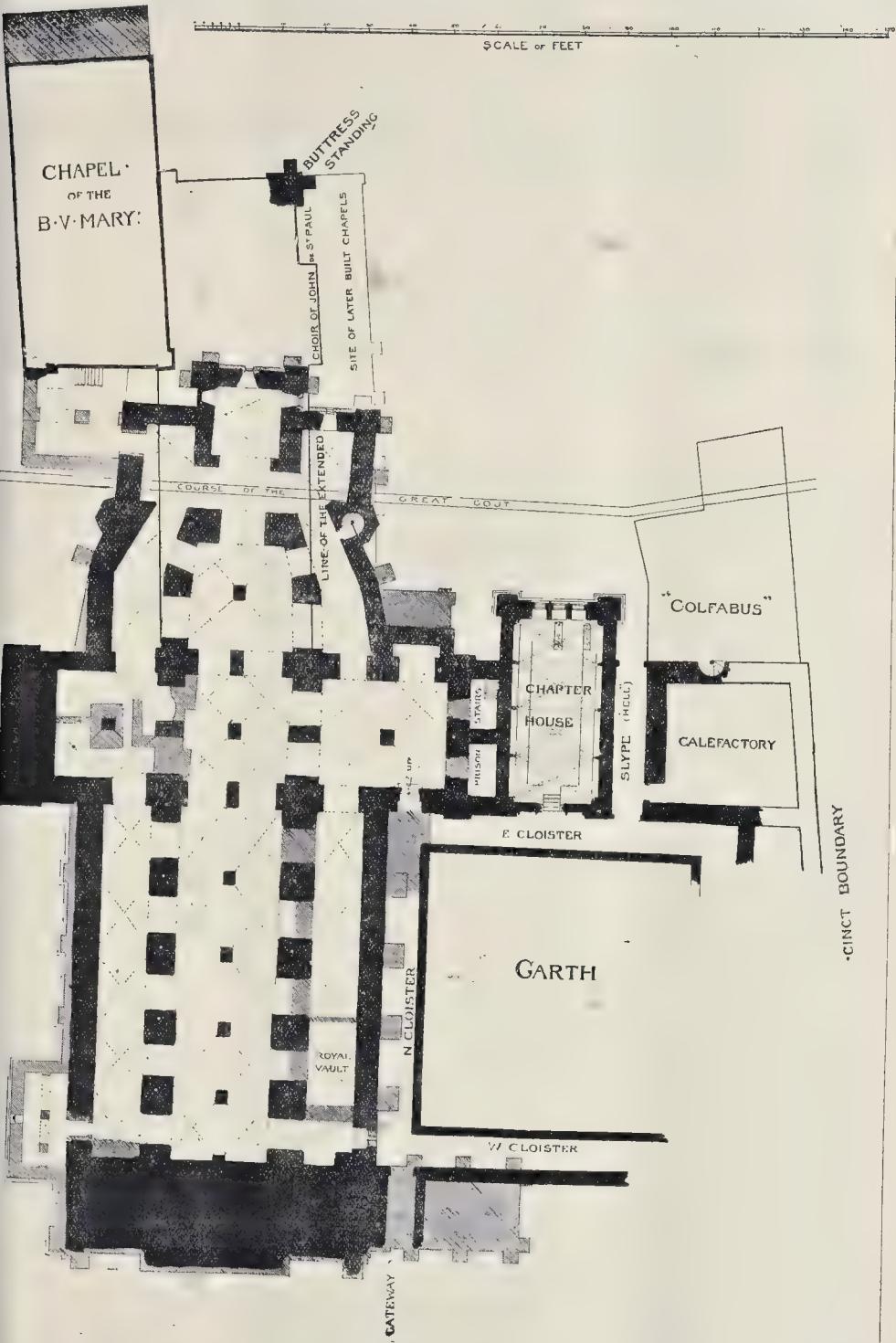
The House  
for "The House" (also known as "The House")  
for "The House" (also known as "The House")



And Mitchell  
for "The House" (also known as "The House")  
for "The House" (also known as "The House")

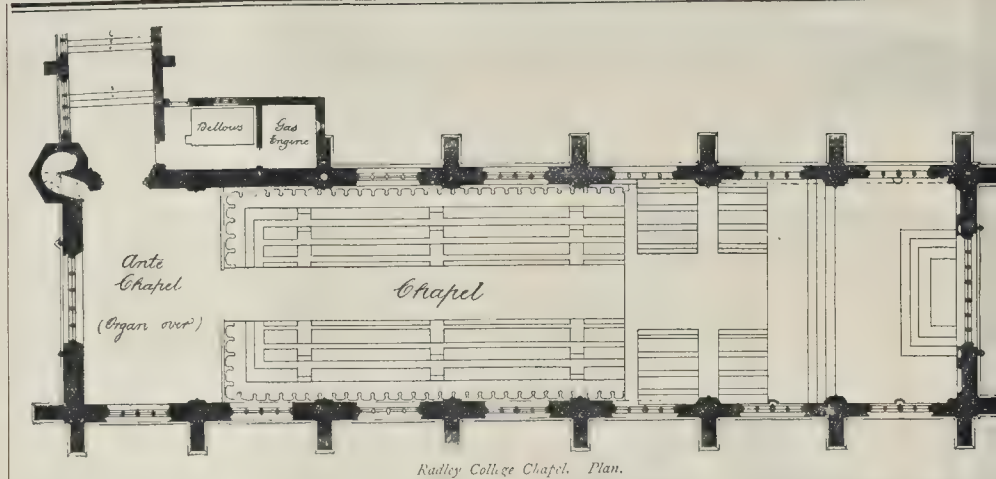






The Crypt, Christ Church, Dublin.





Radley College Chapel. Plan.

It was very much out of line with the axis of the church, but it was good enough to make a side of a choir for John de St. Paul, and he achieved a choir with an "inclination" which was certainly not symbolic in this instance.

Mr. Street found John de St. Paul's ugly choir without a redeeming feature, or one scrap of interesting details, and decided to remove it, and restore problematically, on the basis of the evidences he had, the remarkable termination of the twelfth-century church. The lateral arches, with their characteristics of pointed arches, with chevrons, zigzags, and Romanesque details, remained. The inclining jambs remained, and such a number of stones of the three eastern arches as enabled Mr. Street to replace this chevet with absolute truth until he came to the spandrels, which he dispersed; the triforium and clearstory, which he composed in doublet arrangements of window openings.

There was a very barbarous "restoration" of the choir by an architect named Baker in 1831. There was probably never so wholly despicable restoration perpetrated in the whole history of the Gothic revival. It did not hurt the already mutilated fabric much, but it is to be regretted as destroying much of Elizabethan and Jacobean historic interest.

Christchurch in, all its ruin, preserved all its historic prestige and precedence up to 1870. It was the Chapel Royal and great civic and State ceremonies took place within its walls, and it had a long and unbroken musical history from the time that Laurence O'Toole first introduced choral worship into the Irish church, and "caused his singing men and boys to stand in order at the altar and to lend their voices *dulces modos*," up to the present day. It was comparatively wealthy until its estates were confiscated by the Irish Disestablishment Act in 1870.

Mr. Street found the church then as he truly described it "so deformed and degraded as almost to have dropped out of the category of cathedrals." The very barbarous and indifferent neglect it had suffered had some compensating advantages, for as the incrustations of bad taste were cleared, a wealth of evidence for true and definite restoration was forthcoming. It is on this account that a greatly-restored church as this is of such considerable interest. It has been little written of or described out of Dublin since its resurrection, and comes with surprise on strangers who thought they knew all the church architecture of England in Ireland.

All this stands true until the stranger comes to the exterior of the church. There is some ancient work remaining, but for the most part it is all Street. What purports to be restoration from evidences is entirely wrong. What is problematical is altogether unlikely, and the details are mostly ugly. In the view presented by the *Builder* the south-west porch is altogether a mistaken rebuilding, as a porch, of what was really the cloister gateway, remaining in 1870, and which was lower in level by 8 ft., and once leading to the crypt. The triplet clearstory windows, with ugly pyramidal and curved labels which do not fit the window arches, are a professed restoration, but the "found" window

of evidence, preserved in the crypt as satisfactory proof of their authenticity, but indicates a very clumsy patchwork of the eighteenth century. The "Irish" embrasured parapets simulated want excuse for their introduction as problematical restoration into a church so exclusively exotic and English as Street pronounced this to be. Even these features, and those by way of Irishisms added to the central tower, are but whimsical as restoration, and give a sense of being adapted from photographs of Jerpoint or Kilkenny Abbeys, as they fall in the characteristic quaintness and grace which is subtle in the ancient Irish types. The buttresses and flying buttresses in the view are of Street's designing.

The original church had no such features. It was absolutely necessary for structural reasons to add this innovation on the north side to hold up the inclining wall. For uniformity of plan only they exist on the south side. The only details of ancient work to be now found outside the church are two interesting Norman doorways and the main *corpora* of the transepts dressed up by Street, the west doorway and window restored all new on definite evidence, and some buttresses, and the very interesting remnant of the Chapter-house and cloister discovered and unearthed in 1886. The walls of ancient "Mary Chapel," detached from the church and in the same position as that of the Scandinavian example at Trondjhem, still remain. Its date and origin is still one of the unsolved points in the history of the Christchurch.

Within the last few days the breaking out for a window through iron-hard cement masonry would indicate to the architect the same grouted rude work as distinguishes the Danish work. It may be conceived that this building is more probably the Chapel of St. Nicholas, founded by Sitric and Donat, an invariable institution at all ports where sea-folk resort. It is now converted into a chapter-room and grammar-school. It had been from earliest times embedded among huddled-together houses of the crowded little city, until, in 1886, when the Corporation of Dublin, with public spirit, made a fine approach to open up the old city chief church at a cost of 100,000. The rude gable end of "Mary Chapel" for the first time revealed, proved an eyesore, and a voluntary public subscription was made to give it an architectural character. On the advice of the cathedral architect the Dean and Chapter resolved to refrain from rebuilding the ancient east end in a modern dress, and to mask it by a small library building which was a necessity, and did not pretend to be other than modern. The triplet east window is a careful reproduction of that of the thirteenth-century Chapter-house, placing on record a copy of a feature, the remnant of which is disappearing.

The cost of Mr. Henry Roe's munificent act in rescuing this once forlorn and degraded cathedral under Mr. Street is now known to have been about 160,000, while his whole contribution towards its revival in building a synod-house and securing an endowment for it after the ruin of its fortunes by the Irish Church Act of 1869, amounted to 220,000.

A further contrast between the two cathedrals

lies in their relative amount of interest for antiquarian and archaeologist. St. Patrick's spoliated church. Its records have mainly disappeared, and it is plain that its spoilers, who moved the *seva indignatio* of Dean Swift, St. Patrick's Cathedral alone only when there is little left to rob but the walls of the Christchurch, on the other hand, although lost much in troublous times, has much left for a historian of the Anglo-Norman in Ireland. Its splendid Medieval missals at the Bodleian, and some of its pre-Reformation plate is at Kilkenny. Its "Book of Obits," proctor's accounts, and other records are in the library of Trinity College, Dublin. It has lately transferred to the Public Record Office Dublin more than 2,000 MSS., consisting of leases, Pope's bulls, and encyclicals, and relating to the various *Charta, privilegia, immunitates* of Christ Church.

Some of the earliest MSS. date from 1038, bear the sign manual of the Danish Sitric, the cathedral itself remain still its Black and White Book, Medieval MSS. which are authority for most of the civic history of Dublin. Its *Repertorium Viride* of Archbishop Alan, *Crede Mitri* of the Archbishops of Dublin, and *Novum Registrum* of Dr. John Lyon are record of Chapter Acts of some historic interest. It has a fine store of seventeenth and eighteenth-century church plate that would please the à-brac hunter. Its traditions as the Church of City of Dublin have been unbroken. It is in fact, a revived and curious church of the twelfth, and thirteenth century creation well by Street where he had evidence to guide, externally clothed by him in a garb of his characteristic evolution of nineteenth-century architecture.

#### RADLEY COLLEGE CHAPEL

The new chapel now being built at Radley College by Mr. T. G. Jackson, A.R.A., is slightly to the south of the old chapel and communicates with the rest of the college by a cloister and dormitory above. The old chapel building of temporary construction, but containing some handsome oak stalls and panelling, a very fine old German retables which were removed and fitted with some adaptation to the new building.

The new chapel is 32 ft. wide by 130 ft. including an ante-chapel under the organ and 40 ft. to the plate. The walls are of brick inside and out with dressings of Douling and Weldon stone, and the roof ceiling will be of oak.

The builder is Mr. Estcourt, of Gloucester. Mr. Long is clerk of works. The heating is by Messrs. Haden, of Trowbridge. The drawing is exhibited at the Royal Academy exhibition.

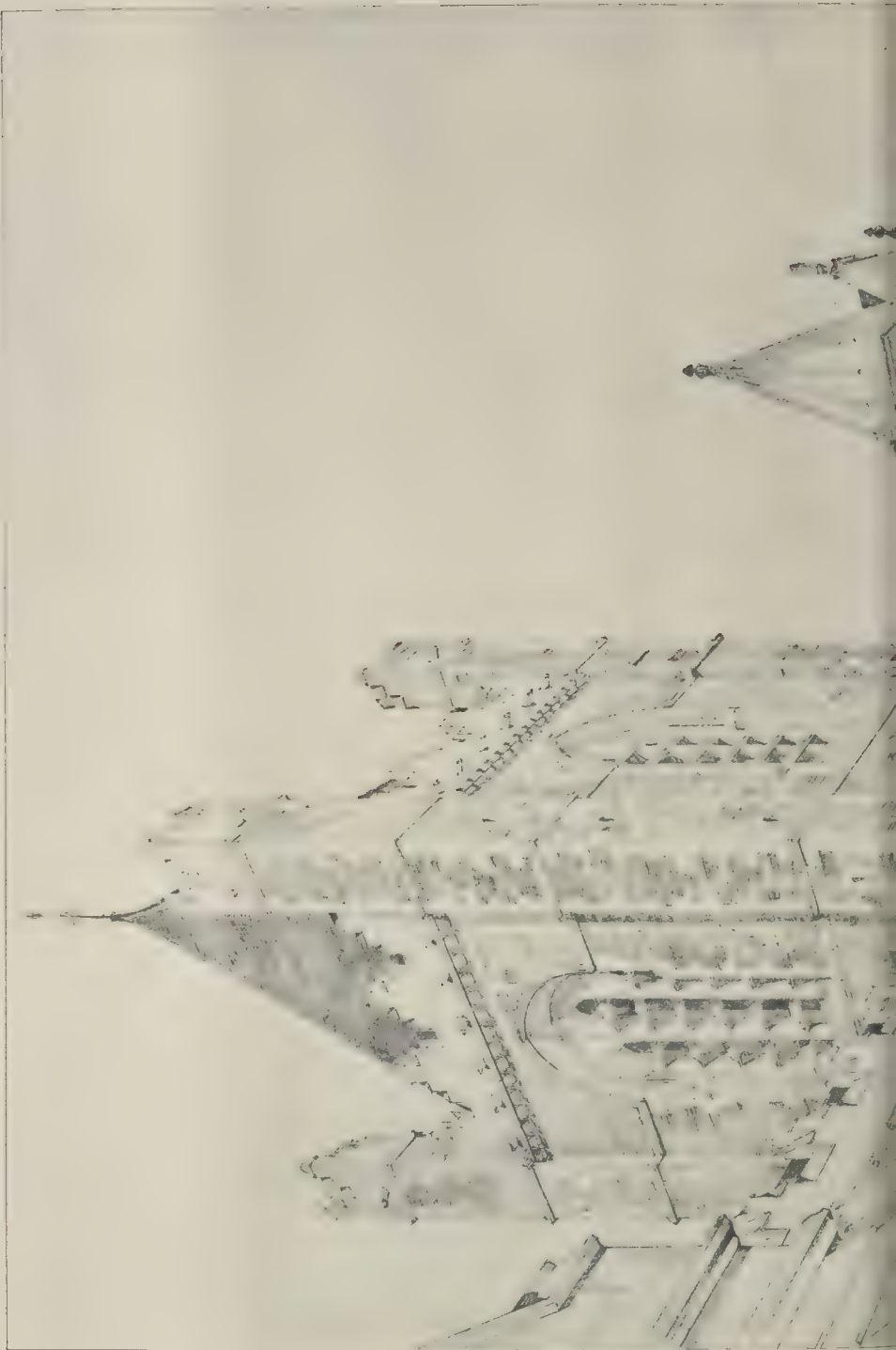
#### SMALL COUNTRY HOUSES.

This sheet of drawings shows houses and buildings that have been erected during the year. All are simple and unpretentious. The premises at Waltham Cross, for Mr.





THE BUILDER MAY 5, 1894





THE SOUTH-WEST CORNER OF THE CHURCH, DRAWN BY MR. ROLAND W. PAUL.

# ANCIENT CATHEDRALS OF IRELAND.—DRAWN BY MR. ROLAND W. PAUL.

No. 2. CHRIST-CHURCH, FROM THE SOUTH-WEST.





& Scarborough, with dwelling-houses over, a variation upon the ordinary town street.

The building has been entirely executed by Messrs. King & Scarborough, without the sanction of the contractor, and the result is satisfactory. The houses, Highfield, rove, The Haven, and St. Keverne have all excellently carried out by Messrs. T. R. & Co., contractors, of Watford. The plan in each case is red brick and tile, timbering executed in oak, the face oiled. St. ne is a large family house, with ten bed-rooms, besides dressing-rooms. Stables at Oak- are entirely built of concrete; the walls, thick, rough-cast externally. Mr. Seth of Aylesbury, was the builder, who also completed Sundial Cottage at North- a brick building covered with rough-cast, ning studio, dining and drawing-rooms, and bedrooms. Economy was the chief desider- here, and endeavour has therefore been to treat the building in the simplest possible all the bedrooms being planned in the roof. The house "Bowls," at Great Stanmore, is erected by Messrs. McCormick & Sons, of Aylesbury, London. The metal-work is by S. de Grelle Houdret, of London Wall. The materials are red brick and tile, and oak ing.

The drawing is in the present Royal Academy tion. ARNOLD MITCHELL.

## Correspondence.

To the Editor of THE BUILDER.

ARCH OF ST. JOHN, DAMASCUS.

"I am quite content to leave the question suggested by Mr. Spiers, and I look forward much interest to the result of his study of the temple precincts. As to the church, impression with which I began—that if the block of the mosque is not formed by the church, then no part of the structure can, with evidence now before us, be claimed as of an building—has become conviction. That, I, forms the alternative.

"I will not now raise any fresh points, and in the briefest way those of Mr. Spiers' or.

"Of course, possible that the roofs of wings been renewed to a steeper pitch. Photographs of the interior show that both have similar dosserets.

"It was certainly a "reason why" the cross- I not form a square. There would be such in the wish to make the church wide as red to the length, and I gave the Isaurian as a direct parallel.

"An Arcadius' time women were not capable owing arches of 45 ft. span." It seems to faulty inference that because Constantine, in try of preparing his new capital, does not to have left any large churches at Con- ample which satisfied the "vaulting" an- of Justinian, that therefore Arcadius was pable of building in any part of the empire as great as those erected in Rome, Con- e's civil basilica and St. Paul's outside the eing examples. As for domed coverings, orge at Salonica furnishes an instance. ty in arched construction might be expected ho who built the Dome of the Rock.

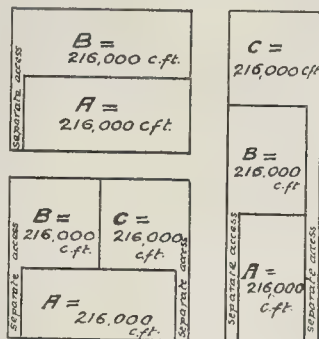
"Dimensions of Bethlehem were taken from given in the Palestine Memoirs.

W. R. LETHBRIDGE.

## ON STREETS AND BUILDINGS BILL.

—Amongst other points in which this Bill unaltered, have not only a serious confis- effect, but prove also extremely prejudicial rection of buildings where large and open ea is required, I have not yet seen atten- ead to the omission of any equivalent of 3, of Clause 27 (Part I.), of the M.B. Act. This, read with Sections 2 and 1 of the lause, provides that any building (speci- fically from chambers or dwelling-rooms) occupation and divided into different tene- with independent staircases or entrances, be deemed to consist of so many separate gs, for the purposes of the Act, and be accordingly, both horizontally and ver- but no one such tenement or building exceed 216,000 cubic feet. Thus, a tene- 216,000 cubic feet may, with a separate

entrance, be superposed on another tenement of equal size, the staircase enclosure and the horizontal division both being party structures; or any number (theoretically) of such tenements may be so erected and dealt with, as shown in diagram, vertical sections:



All the dividing lines are party structures. There is no corresponding provision in Part V., Clause 61, of the new Bill, the only matter specially dealt with being the provisions relating to chambers. The simple limitation remains—or is proposed to remain—that no building of the warehouse class shall contain more than 216,000 cubic feet unless divided by party walls, i.e., vertical divisions, subject only to the special application under Clause 63, which, with its restrictions, will be practically inoperative.

PERCY W. BRITTON.

## THE HEATING AND VENTILATION OF THE HOUSES OF PARLIAMENT.

SIR,—While appreciating as I do your healthy criticism of my report on the above-named subject, I would point out that you have apparently fallen into quite a natural enough error in supposing that the vitiated air passes off from the ceiling of the House of Commons directly into the main extraction upcast shaft in the Clock Tower at or about the same level as that of the vitiated air chamber in the roof of the Debating Chamber.

If you will again go more carefully over the Report and study the transverse section you will find that the vitiated air, let off at the ceiling, has again to be mainly dragged vertically downwards, the whole height or depth of the Debating Chamber and the three basements underneath it, before it is drawn horizontally along the lower basement to the Clock Tower upcast shaft. Bearing this in mind, you will, I am sure, at once see that the proposed new horizontal extraction-shafts under the side galleries—being connected to the vertical downcast airshafts proceeding from the ceiling-vitiated air-chamber to the main horizontal extraction shaft in lower basement—would have a very much stronger pull than could possibly be the case at the ceiling, for the very reasons you give—viz., that the distance from the proposed new extract shafts, under side galleries to the basement, would be so much shorter and more direct in every way, and consequently there would be very much less friction. Your reference, therefore, to what you call my "rather curious and unscientific proposal" is scarcely fair, and could only have been made thoughtlessly, in the actual circumstances, seeing it would really be much easier for the vitiated air to be drawn off under the side galleries, in the manner I show in green on the sketch, than it would be to do so—with the arrangement of upper outlets proposed—at the ceiling. Inlets under the side galleries already in a manner exist or have been tried, and they have not answered, nor can they ever answer, the purpose under the present peculiar conditions.

I never yet knew of a system of propulsion pure and simple, that effected an efficient and satisfactory ventilation of any large building. In the case of the House of Commons there is no lack of fresh air sent in, or that can be sent in; the trouble is rather to get rid of all the vitiated air, and that can only be done effectively by a proper system of extraction, by which the vitiated atmosphere would be drawn out from various points, and by a system that can be handled with ease and arranged to suit all seasons of the year.

JAMES KEITH.

Assoc. M. Inst. C. E.

\* \* \* We did not notice that the lower extract was to go direct into the downcast shaft; of course we know there is one. But that is only reversing the position; the question then will be, why should the air go to the top? It will at all events need very careful adjustment to balance the two extracts so that one shall not act against the other. We are still of opinion

that inlet at that point was the true method, and Mr. Keith has given no reason why it should not answer.—ED.

## QUANTITIES.

SIR,—With reference to the letter from "Country Builder" in your last issue, I would suggest that the architect who took out the quantities either knew or did not know that they were inaccurate.

If he did not know whether they were accurate or not he is not fairly entitled to his fee for taking them off. If he did know that they were inaccurate he deserves more than the law at present will give him.

But he ought to be consistent, and get his client to sign the specification with a clause to this effect:—

"The architect's charges are 5 per cent. upon the amount of the lowest or accepted tender, to be paid by the client in accordance with the rules of the Royal Institute of British Architects, and the client is allowed ten days to satisfy himself that the proposed building will be substantial when completed and for . . . years after."

The moral for builders is, never take an architect's quantities for his own work.

Conduct on the part of any architect such as this is worse than any amount of furniture polish.

F. S. J.

## SOUND THROUGH CONCRETE FLOORS.

SIR,—I am afraid your correspondent "Civitas" will learn that cure is not so good as prevention.

It is probably too late to render his floor quite sound-proof, though matters may be improved.

The cheapest plan would be to put a cushion of felt or india-rubber between the wooden joists and the concrete. I do not think he would do any good with the sawdust plan, unless it were packed so tight as to lift the wood floor off the concrete.

SILENTIUM.

## THE COUNCIL CHAMBER—ARCHITECTURAL ACOUSTICS.

SIR,—As reported in your issue of the 14th ult., Mr. Blashill, in his reply following the discussion of his interesting paper "The Council Chamber and its accessories," said: "There were all kinds of fancies about sound. In the case of the new Opera House at Vienna, where a couple of architects were employed, the Press and a certain portion of the public were unanimous in saying that, although the building was a fine one, the sound was bad; yet, after a few more performances, everyone came to the opinion that it was one of the best places for sound in Europe!" This, Sir, is a very common experience in respect of new buildings. Professor Roger Smith, in his useful little work, "The Acoustics of Public Buildings" (Weale's series), now a little old and requiring to be written "up to date," says: "It is desirable that the architect should be aware that the dampness of walls conduces to a very considerable extent to reverberation in a room. Dr. Hutton gives several illustrations of this fact; (Math. Dict.), and it will often be found that a building hastily completed (especially if its walls be plastered internally), and at once occupied for public purposes, will for some months fail to give satisfaction to the extent that has been hoped, although ultimately, as the walls lose their moisture, acoustic defects will disappear. The cause of these phenomena is obscure, and no satisfactory explanation has hitherto been brought forward, but the phenomena are none the less matter of common observation; and in a new building it may often be as well to hang up a little drapery for a few months, which can be safely taken down when all gets quite dry." We have for many years paid particular attention to this point, and our experience in public halls of all sizes—some very large, others, as small vestry halls, of very modest dimensions—quite agrees with Professor Smith's observations. It is probable that the Viennese press and public were not so fanciful in their judgment after all. The reason for the phenomena probably is the excessive density of the damp plaster.

There should be no real difficulty in designing rooms acoustically satisfactory for one purpose only, as in the case of a council chamber; the real difficulty comes in when the room is to be used for public speaking before both large and small audiences, for vocal and instrumental music, and for balls and bazaars, each of which purposes suggests different construction, yet some kind of average has to be struck so that the room is fairly useful for all but perfect for none.

Of course we are not ignoring Mr. Blashill's special difficulties with regard to the London County Council Chamber which he has so successfully surmounted, and in which he was hampered by having to incorporate the older Chamber not originally built by him.

A. & C. HARSTON.

April 25, 1894.



## DESIGN FOR WALL PAPER.

SIR,—Mr. Gwatkin in his description of a design of wall paper in last week's *Builder*, omitted to mention that the joint to which he referred had been patented by us. We think it only fair that this should be known.

For some time past we have executed a number of Mr. Gwatkin's and other artists' designs in water colours by this process, and the result is as successful as he describes. HAYWARD & SON.

## BOILER EXPLOSIONS.

SIR,—I sympathise with Mr. F. E. Jones' regret at detailed particulars of hot-water supplies not having been given where accidents have occurred owing to frost. I expected ere this to have seen such particulars published of the unfortunate explosion last winter in Blythwood-square, Glasgow, where the bursting of the kitchen boiler was the cause of death and injury to several persons, but as yet I have heard of no report being published, although an examination was ordered to be made by an engineer. Perhaps some other Glasgow readers of the *Builder* may be able to give information as to this?

Mr. Jones' statement that "water freezes from the top downwards" may be true, but so is the other fact true that I mentioned, that warm water is inclined to rise to the top, my argument being that if the expansion or blow-pipe be put in with a rise upwards in all its course, there will be little or no danger of the expansion-pipe from off the top of the hot-water tank of a kitchen boiler freezing, if the said pipe is properly put in, and especially if it is wrapped round with felt, as it should be.

In the case Mr. Jones mentions of the expansion-pipe being thrust up through the slates at a lower level than the water in the pipe, that is simply an example of the plumbers', or quasi-plumbers' ignorance, and affords another proof of the necessity for the Registration of Plumbers' Bill. Mr. Jones does not give us his explanation of why his hot-water pipe he writes about burst immediately above the cylinder. When asking information from others he should have explained his own case.

I do not understand how the "secondary return" can be referred to as "a pipe full of water to be emptied before you get to the hot." The "secondary return" is put in so that hot water may be got immediately.

We have inferior plumbers' work just as we have inferior mechanical engineering work. In both experience has caused improved methods to get improved results, but if these improved methods are ignored, unsatisfactory results follow equally in both cases.

W. P. BUCHAN.

Glasgow, April 30.

## ADMIRALTY EXTENSION BUILDINGS.

SIR,—Having read the correspondence in the *Builder* about the wages paid to the men engaged on the heating work at the Admiralty Extension Buildings, I beg to be allowed to state that the men under me are perfectly satisfied with the conditions of employment, as we are paid at a higher rate than is usual in our trade, and only wish to be left alone. The actual wage, including dinner-hour, which is paid, equals for fitters 10s. 6d. and for labourers 9s. 6d. per hour. We do not attend the shop either morning or evening, and the working hours are from seven till one and two to five p.m., including an allowance of ten minutes I myself make for lunch-time.

F. EDMOND.

\* \* We cannot publish further letters on this matter.—Ed.

## The Student's Column.

## THE STRUCTURE AND PHYSICAL PROPERTIES OF BUILDING STONES.—XVIII.

## 6. THE BATH DISTRICT.

THE material known generically as Bath stone comes from several places miles distant from each other, and from a much larger area than most architects are aware of. It is true that some quarries are exploited on the high ground to the south of Bath, and it is also a fact that from the historical point of view many edifices were erected of the stone from the immediate vicinity of the city. But the area wherein the Bath stone of to-day is raised extends to Box and Corsham on the north-east, Monkton Farleigh on the east, and Bradford-on-Avon to the south-east—many miles from the centre whence the stone was originally obtained. Practically all the quarries are mines, except some on Odd Down, Coombe Down, and at Winsley.

We shall not attempt in this place to give a

detailed description of the quarries. All we now purpose to do is to describe the micro-structure of all the known varieties of the material.

We have divided the Bath district into several areas, corresponding as nearly as may be with the names by which the different kinds of stone are known in the market. They are as follow:—

- a.—Bath area (Odd Down and Coombe Down stone).
- b.—Limply Stoke area (Stoke Ground stone).
- c.—Winsley area (Winsley Ground stone).
- d.—Bradford-on-Avon area.
- e.—Westwood area (Westwood Ground stone).
- f.—Monkton Farleigh area (Farleigh Down and Kingsdown stones).
- g.—Box area (Box Ground stone).
- h.—Corsham area (Corsham Down, Corngit and Hartham Park stones).
- i.—Monk's Park area (Monk's Park, Ridge Corsham and Park Lane stones).

## General Micro-Structure of Bath Stone.

Bath stone may be readily distinguished from all other oolites when examined in transmitted light under the microscope by the presence, in almost every variety of the material, of an abundant matrix which is always thoroughly crystalline. The character of its oolitic granules also entirely differs from any other limestone we have hitherto described. Speaking generally, the intimate structure of these granules is remarkably clear, much more distinct than in the Purbeck-Portland, true Portland, or Chilmark stones. Contrasting them with Portland White-bed, for example, they lack that hazy semi-crystalline aspect so characteristic of the latter; the nuclei in all cases are well defined, the concentric rings or successive coatings being seen to perfection in the Bath stone. The granules of the latter are always much larger, and instead of being joined together by a mere film of calcite with local patches of matrix as in the Portland stone, they are literally flooded with matrix, and frequently do not adhere to each other at all. But, whilst the oolitic granules are clearer than in the Dorset stones referred to, they are by no means as hard or crystalline. Indeed, in the majority of Bath stones, they have barely passed out of the earthy condition. In grinding sections of certain of these Bath stones for micro-examination, the granules were found to be so soft that the mere act of preparation reduces them to a state of powder, and they entirely disappear, leaving circular or ovoid holes, which may be clearly traced in the harder matrix.

At the same time, we have discovered that in certain Bath stone areas the oolitic granules have been removed by the solvent action of acidulated water in percolating the material underground. Thus the circular and ovoid holes may also be indigenous to the material. Now this peculiarity does not appertain to any other of the oolites used for building purposes in England that we know of, with the exception of that quarried at Minchinhampton Common, between Cirencester and Stroud, and which will be referred to in detail in the next article of this series.

Very few Bath stones are true oolites, though they have served as types of that structure for generations. It is true that they all, with the exception of certain beds at Westwood, possess excellently formed oolitic granules; but these latter are interspersed by such a large quantity of the remains of mollusca, echinodermata, bryozoa, &c., that it is no uncommon thing to find not more than one-fourth of the field of a microscopic view occupied by oolitic structure. This is not, strictly speaking, sufficient to cause it to be recognised as a true oolite in the same sense as the stone from Ball's Green, near Avening (Glos.), the "Brown" bed of Chilmark, or that from Ketton. We should term the Bath stones, as a class, shelly oolites having a tendency in certain localities to become shelly limestones without oolitic structure. Quartz grains (and indeed silica in any form) are conspicuous by their absence except in the quarries in the eastern portion of the district.

We have dwelt at some length on the general micro-structure of Bath stone because questions so frequently arise as to whether this or that building is made of Bath stone, or otherwise. Such a sentence as the following—" . . . gateway, seventeenth century, said to be of Bath stone" frequently occurs in works on architectural subjects; or, "near by are the quarries from which the stone used in . . . Abbey was probably derived." The Commissioners appointed to inquire into the stone for building the Houses of Parliament would never have fallen into the fatal error of mistaking the material so well preserved in the Norman portions of Southwell

Minster for that found at Bolsover, if respective stones had been examined by the microscope.

But we go farther than this with Bath stone. We have occasionally drawn attention to the fact that stones found over a wide area are specifiable to considerable variation in structure and quality, and to no district is this observation applicable than to Bath. We know full well the stone as a whole does not bear a remarkable good reputation for its enduring qualities. "Jerry-builder" is desirous of putting "eligible suburban residence" he generally Bath stone, for the simple reason that it is cheaply converted than any other freestone in market; whilst its cream tint and uniformity of other points in its favour. The architect, ever, must not imagine that all Bath stones are inferior quality. We have no hesitation in saying from a very careful examination of all the quarries (save two minor ones) in the district, that stone from certain workings we could name as durable as any other freestone at present in market. The differences between the good stone and the bad can best be discovered by of the microscope, and we have deemed it matter so important that we have had prepared no less than fifty-two micro-sections, cut samples obtained during our visit, for the purpose of investigation. We cannot, of course, describe each of these stones in detail, but the illustrations to be given next week, together with descriptions of typical samples, will serve for the student fully comprehend our meaning.

Now, as to how much the micro-structure of the material tells us in regard to its relative quality. It has been laid down by all previous writers on the subject that an oolite possesses crystalline matrix (*i.e.*, where the granules shell fragments are cemented together by crystalline calcite) is much more capable of withstanding the action of the weather than one in which the matrix is imperfectly developed. That axiom, however, which turns out to be erroneous when the facts are investigated, is no building stone is this more patent than Bath stone. For a thoroughly crystalline matrix and more abundantly developed, could not be imagined than exists in practically all varieties of that material, whether the better, or the worse kinds.

The weathering of the poorer kinds of stone is due in some measure to their comparatively earthy-looking oolitic granules, are easily picked out by the weather; the primary cause is the frequency and openness of the lamellae of the crystalline carbonate matrix; whilst the latter is often permeated minute cracks, and is frequently granular. Nevertheless, the matrix in these inferior oolites is always more durable than the oolitic granules. In the quarries, the student will sometimes find pieces of stone completely honeycombed by removal of the granules, the sole remnant being the matrix. In the better districts of Bath stone the granules are crystalline, and are as lasting as the matrix, whilst the latter has fewer open cleavage planes; moreover, the constituent particles interlock each other. In bulk, the superior kinds will be seen to possess lines or planes of running in various directions, but most right-angles to the bed, and the material is compact. It may be stated that the matrix which has come under our notice are the granules of Bath stone as crystalline in optical effects as in the Portland White-bed, they have not been subjected to much, or secondary alteration, or re-cementation.

The transition in structure from the poor to the superior Bath stones is exceedingly good, and many fairly durable materials are to be occupying the intermediate position.

From what has been said, the student may gather that although there are many different elements in the various stones, the structure is essentially the same. We may enumerate a few of the more prominent features which serve to distinguish one kind of Bath stone from another, analysing each component part. *Oolitic granules*.—Always distinct and formed. Nuclei may consist of a fragment of shell; in some, small and insignificant, in large and controlling the ultimate shape of the granule; some "nuclei" have no coating only. Occasionally three or more nucleoli already partially coated are superimposed, and the whole enveloped by thick layers. Very rarely the nuclei consist of grains. The concentric coatings are sometimes amorphous, and are successively overlaid by lighter and more crystalline layer.



granules minute cracks radiate from the to the circumference. The regularity in is also a point to be noted, as well as the nity of the granules to each other. Special ion should be paid to those which adhere, he nature of the adhesive mineral must be carefully ascertained. In some Bath e granules are light brown in tint; in the matrix is spotted with iron stains, or the inous markings are observed to follow a set

In certain varieties the granules are bly regular and uniform in size, or the ey may be the case, and extremely small ones developed in juxtaposition to abnormally ones.

**Organic Remains.**—Always present in greater quantity. In some varieties of the stone unctured remains of echinoderms, or sea-ss, are very abundant; but the commonest luments are pieces of the shells of mollusca, onally composed of that unstable mineral, hite. Pieces of bryozoa are also rather n in certain kinds, and may be readily uished by their characteristic cellular ire and ornate appearance. The com-ve size of the organic fragments is also eriating feature. Some of them are decomposed, and in an earthy condition, others have all the clear transparency tive of a high state of preservation and lisation.

**Matrix.**—Always a crystalline form of ate of lime, mostly very abundant and up all pores of the stone. Sometimes e, with well-formed cleavage lines; but ecently granulated and much broken up, characters of the matrix have been alluded e course of the preceding remarks.

The student will now carefully note which peculiarities occur in any one Bath stone, n becomes aware that they are constant in stone, and are never found similarly ted in other varieties of the stone. In words, the divers kinds of Bath stone may tinguished one from the other by the ng together of definite sets of structural e, which can only be determined by copic analysis.

## OBITUARY.

**ROBERT ALLEN YERBURY.**—The senior of R. A. Yerbury & Sons, of Kilburn, died iday last, at his residence, St. Margaret's Kilburn, aged seventy-four. Mr. Yerbury sed business at Kilburn in 1842, and was e pioneers of the building operations which ade the Kilburn of to-day. During the long f fifty years he carried on his business so as a reputation for good workmanship and rectitude. His works commenced upon ton estate, and include many important and public buildings, among which may be d St. Mary's Convalescent Home, Broad-Orphanage of Mercy, Kilburn; Queen Orphanage, Paddington; Gordon Memorial, Kilburn; Princess Frederica Schools, en; Wilberforce Schools, Chelsea; Cottage al, Rotherhithe, &c.

## GENERAL BUILDING NEWS.

**CHURCH, SLEIGHTS, NEAR WHITBY.**—The y of turning the first sod in connexion with a new church (St. John the Evangelist) for y, near Whitby, was performed on the 25th y, near Walker. The estimated total cost f edifice is about 3,000*l*. Mr. Christian, of all-place, London, is the architect; and d Padbury & Sons, Scarborough, the con-

**USES, SWANSEA.**—A contract has been n with Mr. David Jenkins, contractor, a, for the erection of new business premises e Mackworth Hotel, Wind-street. The d new premises in Wind-street, so far as the n is concerned, will be of Bath stone and of Dean blue stone, in alternate courses. ound-floor will be occupied by the Capital nces Bank, Limited. In the attic will be rooms and offices for the caretaker, while ill will be erected on each floor. There will e coal-cellars for each block of offices. ictors are Messrs. J. P. Jones, Rowlands, & ve, Swansea.

**IL, NEWCASTLE.**—A block of buildings e the name of the Eldon Buildings have eted at the north-east corner of Grey-street, e, in place of the old Eldon. It consists of t to be fitted up as a grill; on the ground a restaurant occupying the back, the front e being let as shops. The large billiard room, 18 ft., is on the first floor, and above this are

suites of offices. The kitchens are situated on the third floor, from which a goods lift communicates with all the floors. Externally the building is of dressed ashlar in a Classic style, in keeping with the rest of the buildings in Grey-street, and is 62 ft. in height. The front is divided by composite pilasters, with round-headed windows to the first floor and wrought iron balconies to them. The building is lighted by the electric light throughout. The contractor was Mr. Walter Scott of Newcastle, the wrought-iron work being done by Messrs. Bainbridge & Crimmon, of Gateshead, and the decoration by Mr. G. G. Laidler, of Newcastle. The whole of the work has been carried out from the drawings and under the personal superintendence of the architects, Messrs. Oliver and Leesons.

**NEW SUNDAY SCHOOLS AT STOCKTON.**—On the 26th ult., new Sunday school and parish room, built for St. Peter's parish, Stockton, were opened by the Bishop of Durham. The cost of the school, which has been built by Messrs. Craggs & Benson, is about 1,500*l*, and the building consists of one large room 80 ft. by 34 ft., and six class-rooms. Mr. W. H. Linton, of Stockton, was the architect.

**PROPOSED PEOPLE'S PALACE FOR GLASGOW.**—The Glasgow City Engineer has prepared a plan for the proposed People's Palace on the Green. From the designs, which have met with the approval of the committee of the Town Council appointed to consider the question, it appears that the Palace will consist of a front building, containing two large reading-rooms, a museum, and a picture gallery; and at the back there will be a glass-covered winter garden. A site has been secured to the south-east of Greenhead Baths, and the principal front will face the London-street entrance to the Green. The total cost is estimated at 19,000*l*.

**NEW CHURCH, WEDNESBURY.**—A new church has been erected in the King's Hill district, Wednesbury, by Messrs. Hammond, of Darlaston, from designs prepared by Mr. C. W. D. Jonyson, the total cost being about 1,800*l*. The building will seat about 400 persons. It is a red brick structure with stone facings, the whole of the seating accommodation being in the nave. In addition, there is a chancel, organ chamber, clergy and choir vestries, and an arched vestibule.

**PROPOSED RESTORATION OF CHRIST CHURCH, HALIFAX.**—At a recent meeting of churchwardens and sidesmen the plans prepared by Messrs. Horsfall & Williams, architects, Halifax, for the restoration and addition to Christ Church, were taken into consideration. They comprise the following works:—The remodelling of the west end of the church and providing improved access to gallery by the erection of two outside and independent staircases and vestries; the opening out of ante-church vestibule, and throwing the same into the nave, thus providing additional accommodation; the providing of better and more appropriate position for font; the present doorway opening directly into the nave at the south-east corner of same to be permanently closed, and a window inserted; the gallery at the west end to be remodelled, and sitting provided on the curve instead of massed together at right angles as at present. Here will be also provided accommodation for Sunday scholars. Additional accommodation is to be provided for the choir by extending the choir-stalls, and reducing the space now occupied by the Communion. The heating is to be entirely overhauled, and a scheme of ventilation provided. The nave will be roofed by an open-timbered roof. The estimated outlay, including cost of organ, will be about 5,000*l*.

**UNIONIST CLUB, TROON, AYR.**—A new club is being erected in Templehill-street by the Unionists of Troon. The building has a frontage in Templehill-street of about 50 ft. On the lower story there is a line of five shops, and, in addition, premises, also on the street level, are to be occupied as the post office of the district. The reading-room, situated above the post office, is a circular apartment 30 ft. in diameter, and a billiard-room is provided. The main hall measures 79 ft. by 34 ft., and in rear of the principal building will be a bowling alley 53 ft. in length. The style of architecture is the Scottish Baronial, and Mr. Ingram, Kilmarnock, is the architect.

**POST OFFICE BUILDINGS, PONTYPRIDD.**—A new post office has just been opened at Pontypridd. The new premises are centrally situated in Talf-street. The new building has a front elevation of red and white brick. The basement and ground floor cover an area of 48 ft. by 88 ft. Mr. Arthur O. Evans was the architect for the building.

**ADDITIONS TO IDIOT ASYLUM, KNOWLE, BIRMINGHAM.**—The Midland Counties Idiot Asylum at Knowle, near Birmingham, has recently been considerably enlarged from plans prepared by and under the superintendence of Mr. F. B. Osborn, architect, Bennett's Hill, Birmingham. The works have been carried out by Messrs. Barnsley & Sons, contractors, and consist of large central dining and recreation hall, new kitchen and scullery departments, dairy pantries, stores, &c., also four large dormitories, nurses' bed-rooms, linen rooms, and other necessary offices, committee rooms, secretary's office, and school-rooms on each side of the house.

## SANITARY AND ENGINEERING NEWS.

**DRAINAGE AND SEWAGE PURIFICATION, RIPON.**—A special meeting of the Ripon City Council was held in committee on the 10th ult., the Mayor (Alderman Smith) in the chair, to receive the report of Mr. A. E. Preston, C.E., of Bradford, upon the proposed works of sewage purification, intercepting sewers, and new main sewers for the city. From the report it appears that the diversion of the sewage from the rivers Ure and Skell is the most pressing matter, and for this purpose it is necessary to provide intercepting sewers. It is proposed to converge the sewers on Fisher-green, a point about half-a-mile below the city, at the confluence of the rivers Skell and Ure, and to treat the sewage by intermittent filtration, for which twenty-five acres of land will be required. The estimate of the cost is (including land, 2,500*l*), 17,700*l*. The scheme was afterwards adopted by the Council, for presentation to the Local Government Board.

**NORTH BRIDGE, EDINBURGH.**—A special meeting of the Edinburgh Town Council was held on the 25th ult. for the purpose of considering the draft agreement between the Corporation and the North British Railway Company regarding the new railway hotel, and the proposed new North Bridge. The principal points in the agreement are the proposal to construct a new North Bridge with a width of 75 ft. at a cost not exceeding 90,000*l*, the erection by the company of a railway hotel between the Waverley steps and North Bridge-street, with a height of not more than 95 ft. above the level of Princes-street; the contribution by the company of 30,000*l*. towards the construction of the bridge, and the redemption at twenty-six years' purchase of a rent of 125*l*. per annum paid by the company to the Corporation for subjects within the area of the Waverley station. The Lord Provost having explained the agreement, moved that the Council approve of the committee's report, and approve generally of the draft agreement regarding the North Bridge and relative matters, and remit to the committee, with powers to have it finally adjusted with the railway company, executed and confirmed by Parliament, and to proceed with the North Bridge Improvement Bill. Treasurer McCrae seconded. With regard to the height of the hotel, he thought 90 ft. should have been the extreme height sanctioned by the Corporation; but they must remember that in agreeing to the 95 ft. asked by the railway company they had got considerable concessions, the railway company now being not only willing to throw into the public pavement that part represented by the present area, but bound to put back the wall of their building 10 ft. further still. They would thus have an area which, although not open to the public, would be of advantage in apparently diminishing the height of the building in Princes-street. Mr. Kinloch Anderson contended that the rebuilding of the bridge, according to the evidence of Sir William Arrol, was premature, and moved that the agreement be disapproved. At this point it was agreed that the clauses of the agreement should be considered *seriatim*. This having been done, the amendment, which had been seconded by Mr. Brown, was withdrawn, and the motion became the unanimous finding of the Council. A deputation to London to support the Bill was appointed.

**PROPOSED SEWAGE WORKS, RICHMOND.**—A Local Government Board inquiry was held on the 26th ult., by Mr. Kienzi Walton, M.Inst.C.E., at the Board Room Main Drainage Works, Mortlake, with reference to an application by the Richmond Main Sewerage Board to borrow 7,500*l*. for additional works. The plans of the proposed works were explained by Mr. William Fairley, Assoc. M.Inst.C.E., F.G.S., the engineer, and include a triple expansion pumping engine, capable of pumping 12 million gallons in twenty-four hours, additional sludge-presses to be worked on a combined system of air-pressure and direct pumping, screening-chamber, outfall to river, storm overflows, and other works.

**ELLAND DRAINAGE.**—On Wednesday a Local Government inquiry was held by Colonel J. O. Hasted, R.E., into an application for powers to borrow 13,500*l*. for works of main drainage and sewage disposal, and 800*l*. for the purchase of land to be used as a rubbish tip. The estimated cost of the works relating to the sewage does not include land, twenty acres of which will be leased from the trustees of the Savile estate on favourable terms. Mr. Malcolm Paterson, M.Inst.C.E., explained the scheme. The drainage works include several hundred yards of cast-iron pipes to be laid in the bed of the river Calder, or suspended on brackets from the river wall, a syphon 132 ft. long under the same river, and another 75 ft. long under the Calder and Helbie Canal. The sewers discharge at a single point by gravitation. The ordinary flow of sewage was estimated at 75 galls. per head, including the whole of the trade refuse of Elland, which is an important woollen manufacturing district. Tanks for a population of 12,000 were designed, with a net capacity of 600,000 galls. After precipitation, which will probably be by lime, assisted by some other chemical agent, the effluent will be filtered through twelve acres of the land, which is well fitted in its nature, contour, and level, for the purpose,



being a sandy river alluvium, containing much ferruginous deposit. The inspector viewed the land and the lines of the three outfall sewers.

#### STAINED GLASS AND DECORATION.

**WINDOW, ST. MARGARET'S CHURCH, ILKLEY.**—A new stained-glass window was dedicated recently in St. Margaret's Church, Ilkley. The window has been inserted on the south side of the edifice, and has been designed by Sir E. Burne-Jones. There are four angels bearing musical instruments, with a background of diaper work, and the text "In heaven their angels do always behold my Father which is in heaven" is written on a scroll under the figures. The glasswork has been executed by Morris & Co., Merton Abbey, Surrey. The total cost of the window is 100*l*.

#### FOREIGN AND COLONIAL.

**FRANCE.**—The Conseil-Général of the Seine has approved of the project drawn up by M. Poussin (architect) for the construction at Fresnes-les-Rungis of a large Departmental prison to replace St. Mazas, Ste. Pélagie, and La Roquette. The Conseil-Général of the Seine is at present discussing the building of a new hotel to accommodate the Prefect of the Seine and the administrative services of that department, which is at present housed in the Hôtel de Ville. M. Moncel, "Maitre des Requêtes" to the Council of State, has been appointed general secretary for the 1900 Exhibition.

The various sculptural groups in staff modelled by M. Fremiet and M. Falguère to decorate the fountain basin of the Trocadéro have been so disintegrated that it has been decided to remove them. The death is announced at Paris, of M. L. H. Lefort, architect, and Member of the Conseil d'Hygiène of the arrondissement of Sens.

A large hospital is to be erected at Renazé with funds left for the purpose by a rich proprietor in the neighbourhood. M. Ridel, of the Department of Mayenne, is the architect. The town of Vichy is going into extensive works of embellishment and sanitation at a cost of three million francs.

Extensive works are about to be undertaken at Nice for the improvement of the port, the completion of the Public Gardens, the construction of sewers in the Carabacel quarter, and the creation of an open air circus in the "Vallon des Fleurs."

The total expenditure is estimated at about 1,200,000 francs. At Châteauroux works at an outlay of 1,800,000 francs are to be entered on for the building of a hospital, a Hôtel de Ville, a Public Library, and a covered market. Plans for the improvement of the port of Boulogne-sur-Mer have been definitely adopted, at a cost of 15 to 20 million francs. The Lyons Exhibition was formally opened on Sunday last.

**GERMANY.**—The Emperor has nominated Professor Dr. Hans Müller Permanent Secretary of the Royal Academy of Art at Berlin. He is chiefly known as an authority on the History of Music, and was President of the German Commission at the Vienna International Music and Theatre Exhibition in 1892.

The Emperor has granted 5,000*l*. for the restoration of the Great Hall of the Caffarelli Palace, the German Embassy in Rome, and for its decoration with frescoes by Professor Prell. The municipality of Berlin has granted 15,000*l*. towards the 1896 Industrial Exhibition on condition that the same amount be handed over to a charitable institution from any surplus there may be at the close of the show. The authorities offer the Treptow Park as the site. The supporters of the Lietzen Lake site declare it offers better and more agreeable communications with the city, and is in a wealthier quarter than the Treptow site, which is in the east end; moreover, the municipality of Charlottenburg will grant 7,500*l*. to the exhibition should the western site be chosen. The German Fishery Society has decided to hold an exhibition in connexion with the Industrial Exhibition in 1896.

The Berlin Art Exhibition will contain a collection of this year's publications of the "Society for Etching." The place where Professor Siemering's model of the Philadelphia Washington Monument formerly stood will be occupied by a large equestrian statue of the Emperor William I., by Professor Hilger. Among the Arts and Crafts exhibits will be a room decorated by the Munich painter Josef Rost. The rebuilding of the Marienkirche is so far completed that the opening ceremony is expected to take place in September. The new stained-glass windows, costing nearly 1,000*l*., are shortly to be fixed.

**DENMARK.**—King Christian the other day made an inspection of the Marble Church, which is now rapidly approaching completion. The bells were tried for the first time. The work now remaining is entirely internal. The mosaic floor is finished and the heating apparatus has been approved, and the scaffolding, too, around the main entrance has been removed. It is expected that the church—or, rather, cathedral—will be consecrated at Whitstuntide. The present architects are Professor Meldahl, Crown Architect, and Herr Jensen, acting architect. The designs for the huge dome to the vestibule of

the Glyptothek, or new Art Gallery, in Copenhagen, have now been finished. They will be executed in terra-cotta. An improvement has been made in the building regulations of Copenhagen with reference to kitchen sinks and the escape of noxious smells. A new church is to be erected in the town of Skive. The cost will be 100,000 kr., a legacy left by a private individual. The ancient "Cloister Church" at Horsens has been restored; the work, which was carried out by the State, has occupied six years, the architects being Professor Storck, the well-known antiquarian architect, and Herr Estrup. The municipality of the city of Kallundborg has decided to provide new gas and waterworks at a cost of 200,000 kr.

The authorities of Ribe Cathedral, in Jutland, have purchased certain houses around the edifice, which are to be demolished, and the site laid out as gardens, in order to improve the aspect of the cathedral. The death is announced, at the age of ninety-three, of Prof. Privy Councillor P. W. Forchhammer, the well-known Danish archaeologist. The excavation of the ruins of the old church at Grenaa has now been completed, and the authorities of the National Museum, Copenhagen, have decided to preserve the ruins, which show the complete plan of the edifice. The work of restoring the ancient Castle of Vallø after the fire is rapidly progressing. The so-called "round" tower, which was cracked from top to bottom, has been repaired with cement and anchors, and the "square" tower is now in hand. The walls have been found far less solid than was at first supposed, and they have, in consequence, suffered greatly from the fire. The work is being carried out by the Crown architects.

Excavations have been effected by the National Museum of the ruins of the castle, Lilleborg, in the island of Bornholm, in the Baltic. The walls are fairly intact. A number of antiquities have been found. The castle was destroyed in the thirteenth century. The demand for electricity in Copenhagen is so great that it has been decided to enlarge the municipal system at a cost of 22,000 kr. A German firm proposes to commence the reworking of the old limestone quarries at Sangstrup, near Grenaa, with the stone from which many ancient churches in Jutland were built.

One of the greatest engineering works undertaken in Denmark has been completed of late, viz., the construction of the great breakwater at Knudshoved in the Great Belt, and *viâ* which passes the railway and steamboat traffic with the Continent. It is 950 ft. in length, and was commenced by a firm of contractors in 1890 under the supervision of Government engineers. The cost has been about 450,000 kr.

#### MISCELLANEOUS.

**ARCHAEOLOGICAL DISCOVERIES NEAR CARDIFF.**—Some discoveries of an archaeological character have been made on the Ely Racecourse, near Cardiff. Trenches were dug, and in two of them were found sections of Roman hypocaust hot-air pipes, fragments of Roman pottery of a black and greyish colour, pieces of Roman mortar, a boar's tusk, and two portions of human bones. The discoveries made do not quite coincide with the theory of Mr. Storie that a marsh village formerly existed on the racecourse, but there is every indication that the spot was once the site of a large Roman villa or encampment. The investigations will be continued under the auspices of the Naturalists' Society. *Illustrated*.

**GALLOWGATE, NEWCASTLE.**—A large slice of the old houses at the south side of Gallowgate has now been removed, says the *Newcastle Chronicle*, and probably ere a few months pass away the whole of that portion of the street, with the baths included, will be razed to the ground. There will be enough land left, however, for the formation of a few shops after the widened thoroughfare has been made. The present improvement has been decided upon after mature consideration, and after various suggestions for a wider thoroughfare to the Barrack-road had been made. One of these suggestions was to cut a way straight through the property in the neighbourhood of the Co-operative Stores in Newgate-street and form a wide road from that way to Gallowgate. Another idea, embodied in plans shown at the Jubilee Exhibition in 1887, was that of Mr. J. W. Taylor, architect. It was to make a thoroughfare directly through the old property at the foot of Percy-street, carry it behind Albion-street, over the lower portion of the Leazes, and straight on to the Barrack-road. Both these ideas were excellent, and neither would have entailed a fabulous expense. As the Corporation, however, have decided on the middle course, the public have nothing now to do but to acquiesce and be satisfied. But what a change there will be in Gallowgate if the new infirmity should be built on the Leazes, and a wide thoroughfare, with tramlines, constructed to run to the north-west end of the city!

**INVENTIONS EXHIBITION IN COPENHAGEN.**—An international exhibition of modern inventions is now being held in Copenhagen. The majority of exhibitors are foreign, mostly German. There are 303 exhibits, including motors of all kinds, automatic tools, artesian bores, electric apparatus, transport appliances, furniture, stoneware, lightning and

ventilation apparatus, sewerage improvement pumps, &c.

**SURVEYORS' INSTITUTION PRIZES.**—The Secretary of the Surveyors' Institution writes that in the list of the candidates who have passed their examination (page 365 *ante*) the asterisks referring to footnoting the winners of prizes appear to refer to names following them instead of those preceding them, which are the prize-winners' names. We note it so; an asterisk is usually placed at the end of the name or sentence to which a footnote refers, and not at the beginning, and a space left by the printers between the asterisk and the following name. To make it quite clear, however, we may state that the asterisk references in the refer in each case to the name preceding them.

**THE ALBERT PALACE, BATTERSEA.**—The site fixed for the 29th inst. of the materials at Albert Palace, Battersea, and Connaught which formed part of the Dublin Exhibition. The sale will be made by order of the Committee of Her Majesty's Works, but it seems likely to extend to the great organ which, we read, has been bought for the new Abbey Church at Fort Augustus in Scotland. It is also stated that arrangements pending for a disposal of all the palace site building purposes. The materials comprise 1,000 of wrought and cast iron in girders, columns, principals, &c., and 16,000 ft. of flanged hot-rolling, with 1,000 ft. of iron railing. The palace has remained closed for six years past, having last used for a "Wild West" entertainment.

**JERUSALEM AND JAFFA.**—According to a report of the British Consul at Jerusalem, it seems that ancient Jerusalem is fast going the way of ancient Rome. On the western side houses increased so rapidly within the last few years that a large suburb called "Modern Jerusalem" has where previously fields and vineyards existed. A valuable piece of land is being bought by benevolent societies, missions, and private persons. During the past year the firm public garden was completed on the side of the Jaffa gate, and although, as long as Jerusalem has not a proper water supply, any improvement of the kind must necessarily be on a small scale public garden has, in addition to providing inhabitants with a place of resort and recreation away with what formerly used to be a waste. At Jaffa, a series of buildings, consisting of a row of stores with dwellings over them, are being constructed by the Greek Convent just outside the gate of the town. It is reported that a canal for irrigating the orange-groves and plain of water from the river Auga has been given by Mr. Navon, of Jerusalem, the concessionaire for Jaffa-Jerusalem Railway.

**ANTIQUARIAN FIND AT BUXTON.**—Griffin, an ancient barrow, better known as Solomon's Tomb, on the summit of a hill overlooking Buxton, has been opened by permission of the Duke of Devonshire. Some local antiquarians personally took the excavation, and were rewarded for their trouble by finding, just a foot from the surface, the skeleton of a human being. A foot deeper another skeleton. Between the body and the legs a rude earthen vessel, 4 in. in height and 2 in. wide, the interior being of dark blue colour, and outside a pale red. On the exterior is a human figure. The vessel is stated to be early British, the skeleton, which was in a more perfect condition than the first-named, was laid in a cist, and was the person nearly 6 ft. in height.

**AN ANCIENT GATE OF TOWNES.**—Respectable antiquaries, better known as Solomon's Tomb, on the summit of a hill overlooking Buxton, has been opened by permission of the Duke of Devonshire. Some local antiquarians personally took the excavation, and were rewarded for their trouble by finding, just a foot from the surface, the skeleton of a human being. A foot deeper another skeleton. Between the body and the legs a rude earthen vessel, 4 in. in height and 2 in. wide, the interior being of dark blue colour, and outside a pale red. On the exterior is a human figure. The vessel is stated to be early British, the skeleton, which was in a more perfect condition than the first-named, was laid in a cist, and was the person nearly 6 ft. in height.

**THE TOWER BRIDGE SOUTHERN APPROACH.** The case of the Corporation of London against application of the principle of betterment under Bill promoted by the London County Council opened on the 1st inst. by Mr. Littler to the Committee of the House of Commons, presided over by Mr. Coddington. He contended that the principle of betterment was better than the principle of the Corporation who had spent 1,000,000*l*. on the Tower Bridge did not ask for betterment at all. The sum under that head was a comparatively small one, and those who seemed to be bettered would not contest the great question of principle against wealthy body like the London County Council, and would have to go to great expense to limit, therefore, such a large question. It was not properly settled in a Bill of this kind. Chairman gave the judgment of the Committee follows:—The Committee has decided that the principle of the Bill is proved subject to these conditions—that the betterment charge should only apply



clearly shown that property is substantially and permanently increased in value by the improvement. It also considers that before the alterations are put upon property owners affected shall have power to get that a valuer be appointed by the Local Government Board to make an independent valuation at the expense of the London County Council such as and situated within the limits of deviation the London County Council consider will be subject to betterment, and the Committee are of opinion that the subsequent valuations for betterment should be included in one assessment.

**LANGSTON'S PATENT FOLDING FIREGUARD.**—This is a form of fireguard constructed to be hinged to the grate or mantelpiece permanently, and to be in folding pieces and fold back against the sides of the grate. It seems quite feasible, and is certainly better than the fireguard hung on to the sides, which is an insufficient protection and looks ugly. This one, as the patentee, Mr. H. Ardwick Langston, points out, may be made an ornamental adjunct to the fireplace, and serve as a screen or front of it when not in use.

**THE NATIONAL GALLERY.**—Mr. Poynter, R.A., has been selected to the vacant directorship of the National Gallery. The choice between him and Mr. Sidney Colvin, Keeper of Prints at the British Museum, and late Slade Professor of Fine Art at Cambridge.

**THE CITY COMMISSION OF SEWERS.**—At the annual meeting of this Court on Tuesday, the principal subjects discussed were the question of closing swimming-baths and washhouses within the City, the widening of Milton-street, Cripplegate, the reappointment of Dr. Wm. Sedgwick Under as Medical Officer of Health. In opposition to the motion of Mr. A. C. Morton, M.P., to put the question of the baths to the Sanitary Committee, a previous question was moved as an amendment by Mr. Miller, but the amendment was carried by a large majority, and the original motion carried by 41 against 6. A deputation of the City of St. Giles', Cripplegate Without, was introduced by Mr. Deputy Harvey to advocate the removal of a portion of a single house, and its insertion into the roadway of 50 superficial feet of its effect, which would be to give a clear width of 24 ft. instead of 23½ at one end, but only 19 ft. 6 in. at the other, which the City now has. No real opposition to the reappointment of Dr. Saunders was offered, but Mr. Wallace, Chairman of the Finance and Improvement Committee, moved to refer the question to a special Committee, which would meet next day to consider the question of reappointments to vacancies in the engineers' department. The attention of the Sanitary Committee was drawn to the insanitary condition of a court in Cripplegate, Bridgewater, which was described by a member as almost a plague-spot in the City, which had seen improvement for 200 years.

LEGAL.

**BUILDING LINE CASE, MIDDLESBROUGH.**—On the 25th ult., at the Middlesbrough County Court, Mr. C. J. Coleman, stipendiary judge, gave judgment with respect to the action of the Corporation of Middlesbrough against Mr. Scott, the builder, for not having set back, in accordance with the order of the Court, a certain end building in Linthorpe-road. Mr. Scott is owner of a plot of land at the corner of South-road and Linthorpe-road on which were three wooden buildings used as shops, all of which were in close proximity to the footpath, and the Corporation claimed a 30-ft. set back in Linthorpe-road and a 70-ft. set back in Southfield-road. No building had been built in 1874, and before the Public Health Act was passed empowering the Corporation to deal with such houses, could not therefore be set back, and as No. 2, which adjoined Southfield-road, could not, in the opinion of Mr. Coleman, be set back within the 70-ft. set back, these two houses were dismissed, but in the case of building No. 3 he decided that the Corporation needed, and ordered defendant to pay the costs, and the penalty at the nominal sum of 5s., as he deemed that the defendant would at once remove the building. Since that decision defendant had built a close of No. 3 and brought it in a line with the other two buildings together by a 30-ft. set back, and those buildings were still several feet in advance of Ashburton-terrace, which the Corporation claimed to be the building line in Linthorpe-road. Mr. Bainbridge, Town Clerk, submitted that the order of the Court had not been complied with. Mr. Farrington, for the defendant, stated that he had complied with the requirements of the Public Health Act, No. 1, by building the building line in Linthorpe-road and Ashburton-terrace, and they had brought No. 3 into line with that line, and he submitted the Corporation did not take a considerable portion of Mr. Scott's property as they were endeavouring to do without commencing an action for it. Since the former proceedings, the defendant had been made defendant, and Mr. Bainbridge argued that this was unlawful as any building would be an offence under the Act if it came in front of Ashburton-

terrace, he (Mr. Coleman) decided that defendant was entitled to a fresh written notice. He regretted the case should be decided on a technical point and not on its merits. He, therefore, dismissed the summons with costs.—*Yorkshire Herald*.

OBSTRUCTION OF ANCIENT LIGHTS AT BRADFORD.

In the Chancery Division of the High Court of Justice on Friday, last week, a motion was heard by Mr. Justice Fry on the part of Edward Pye and Chas. Greening, for an injunction to restrain Alfred Rendell from the erection of buildings in Albion-court, Bradford, which the plaintiffs alleged interfered with their ancient lights.

Affidavits from engineers and architects on both sides were handed in, and models submitted, and at the conclusion of the arguments his Lordship granted the injunction, and refused to permit continuance.

Mr. Byrne, Q.C., appeared as counsel for the plaintiffs, and Mr. Farwell, Q.C., for the defendant.

LIGHT AND AIR CASE.

In the Chancery Division on Tuesday Mr. Justice Aldrich gave a considered judgment in the case of Aldin v. Latimer Clark & Co. (argued last sittings), it being an action by the lessee of certain premises at Richmond, Surrey, to restrain the defendants, the owners of adjoining property, upon which they had erected works for the purpose of supplying the town with electric light, from violating in various ways his rights as lessee. The chief ground of complaint on the part of the plaintiff was that the works erected by the defendant company injuriously affected the access of air to the drying-sheds used by him in his business of a timber-merchant, so as to render them substantially less useful for the purposes of such business carried on upon such premises. The plaintiff also complained of alleged interference with a right-of-way granted by a certain indenture of lease dated July 1, 1878; of interference with certain ventilators in his stables; and of user of the defendants' property so as to heat his (plaintiff's) stables, and render them unhealthy, and so as to endanger his premises and stock-in-trade, and cause risk of damage by fire.

The plaintiff derived his title from a Mr. Munro, who was also the predecessor in title of the defendant company. The facts are shortly as follows:—In April, 1878, Munro agreed to sell the goodwill of his business of a timber merchant to the plaintiff for 1,000l., and to grant him a lease of that portion of the property on which that business was carried on. On July 11 Munro granted the plaintiff a lease of the premises in question with buildings thereon for twenty-one years, with a right-of-way over a portion of the adjoining property, and such lease contained a covenant for quiet enjoyment in the usual terms. After the death of Munro his devise sold the whole of his property (including that demised to the plaintiff) to the defendants, who proceeded to erect thereon their electric lighting works.

His Lordship, in the course of an elaborate judgment, said that he had come to the conclusion that some injury to the drying-sheds had been made out, but not sufficient to justify the granting of an injunction. The plaintiff was entitled to an inquiry as to the damages he had sustained by reason of the buildings rendering the sheds less fit for use in the ordinary course of his business as a timber merchant. With regard to the other part of the case, the learned judge said that he was of opinion that Munro became subject to the obligation to abstain from doing anything on his adjoining property which would substantially interfere with the carrying on of that business in the ordinary course; and that obligation bound the defendants, as assigns from him, subject to existing lease.

Mr. Graham Hastings, Q.C., and Mr. Ingpen appeared as counsel for the plaintiff; and Mr. Finlay, Q.C., Mr. P. Beale, Q.C., and Mr. Marcy represented the defendants.

CAPITAL AND LABOUR.

**CONCILIATION IN THE NEWCASTLE BUILDING TRADE.**—At an adjourned meeting of the representatives of the Building Trade Federation and of the men connected with the joiners, millwrights, and sawyers in Newcastle and Gateshead, held on the 27th ult., the Rev. Canon Moore-Ede, in the chair, it was agreed that an advance of a halfpenny per hour should be granted to all joiners, millwrights, and sawyers whose wages are at present less than 9d. per hour, such alteration to come into force on the 1st August next. It is hoped that now this wages question has been amicably arranged, and a conciliation Board on the point of being established, that the day of stoppages of work and dislocation of the local building trade is past.

**STRIKE OF BRICKMAKERS AT WEST THURROCK.**—A number of trades union brickmakers have struck work at the Grays Chalk Quarry Company's works, and also at Messrs. Gibbs's works, West Thurrock, as a protest against a proposal by the employers to reduce the pay to 9d. per thousand. Such reduction, according to the statements of the men, would affect

their wages to the extent of 9s. 6d. per week in some cases. Non-union men are filling the vacancies created.

**BRICKLAYERS' STRIKE, SOUTHEA.**—On Monday last there commenced a strike of the bricklayers and labourers of Southea, the whole of whom left their work on that evening. The number of men on the two branches now out is estimated at about 780, but if the struggle should prove to be a protracted one, hundreds of men in other branches will shortly be compelled to suffer in consequence. A similar strike took place in March of last year, but happily ended in little over a week by the masters giving both branches 3d. per hour more, viz. from 7d. to 7½d. and from 5d. to 5½d. respectively. The present demand is an additional 3d. on each branch (i.e. from 7½d. to 8d., &c.). The Mayor of Southea has been endeavouring to act as mediator, but without success.

MEETINGS.

**FRIDAY, MAY 4.**  
*Architectural Association.*—Members' Soirée, to be held in the Holborn Town Hall. 7.45 p.m.

**SATURDAY, MAY 5.**  
*Architectural Association Camera Club.*—Visit to Hampton Court Palace, by special permission.  
*Sanitary Inspectors' Association.*—Mr. W. W. West on "Sewer and Drain Ventilation." 6 p.m.  
*St. Paul's Ecclesiastical Society.*—Visit to the Church of St. Helen's, Bishopsgate, under the guidance of Mr. G. H. Birch, F.S.A. 3.30 p.m.  
*Queen's College, Cork.*—Mr. Arthur Hill on "The History of Architecture." XVII. 3 p.m.  
*Edinburgh Architectural Association.*—(1) Visit to Biel; (2) Visit to Stenton Church.

**MONDAY, MAY 7.**  
*Royal Institute of British Architects.*—Annual General Meeting. 8 p.m.  
*University Extension Society (Chelsea Town Hall).*—Mr. Roger E. Fry, M.A., on "Leonardo da Vinci." III. 3 p.m.  
*Sanitary Institute (Lectures on Meteorology in Relation to Hygiene).*—Dr. C. Theodore Williams on "Climate in Relation to Health and Geographical Distribution of Disease." 8.30 p.m.  
*Society of Engineers.*—Mr. R. Nelson Boyd on "A Deep Boring near Freistadt, Austria, by the Canadian System." 7.30 p.m.  
*Victoria Institute.*—4.30 p.m.  
*Liverpool Architectural Society.*—Annual General Meeting, when the closing address by the President, Mr. H. Hartley, will be delivered. 7.30 p.m.

**TUESDAY, MAY 8.**  
*Institution of Civil Engineers.*—(1) Paper to be further discussed—"The Manufacture of Briquette Fuel," by Mr. William Colquhoun; (2) (Papers to be read, time permitting):—a. "Recent Types of Ferry Steamers," by Mr. Andrew Brown; b. "The Birkenhead Ferry-boats, *Wivral and Mercury*," by Mr. William Carson. 8 p.m.  
*Society of Arts (Applied Art Section).*—Mr. J. Starkie Gardner on "Pewter." 8 p.m.

**WEDNESDAY, MAY 9.**  
*Carpenters' Company (Carpenters' Hall, London Wall).*—Mr. Thomas Blashill on "Doors, Windows, and Ornamental Joinery." 8 p.m.  
*Society of Arts.*—8 p.m.

**THURSDAY, MAY 10.**  
*Institution of Electrical Engineers.*—Continuation of discussion on Mr. R. E. Crompton's paper on "The Cost of Electrical Energy." 8 p.m.  
*Sanitary Institute (Lectures on Meteorology in Relation to Hygiene).*—Mr. F. Gaster on "Fog, Clouds, and Sunshine." 8.30 p.m.  
*Society of Antiquaries.*—8.30 p.m.

**FRIDAY, MAY 11.**  
*Architectural Association.*—Paper by Mr. Henry Longden, entitled "Practica. Remarks on the Working of Wrought Iron," with Examples. 7.10 p.m.  
*Sanitary Inspectors' Association.*—Annual Conference, Nottingham.

**SATURDAY, MAY 12.**  
*Incorporated Association of Municipal and County Engineers.*—Lancashire and Cheshire District Meeting, to be held at Chester.  
*Sanitary Inspectors' Association.*—Annual Conference, Nottingham (continued).  
*Queen's College, Cork.*—Mr. Arthur Hill on "The History of Architecture." XVII. 3 p.m.

RECENT PATENTS:

ABSTRACTS OF SPECIFICATIONS.

5,703.—WOOD-CARVING MACHINES: *H. H. Adams.*—In wood-carving machines, where a gang of rotary cutting tools are employed, all operated simultaneously to produce carvings; the improvements are mainly embodied in the mechanism whereby a movable support, in which is mounted the counter-shaft, is adapted to have vertical and horizontal endwise adjustments.  
5,355.—LADDER STAND OR PLATFORM: *J. H. Heathman.*—The platform, which is the subject of this patent, is made so that it can be used either before or behind a ladder. The framework is made jointed, so that the stand can be pushed through between the ladder sides, out of the way of any person ascending the ladder, and drawn out again after the person has passed it. The stand is supported by diagonal arms, on which hooks are affixed.  
10,045.—FIREPROOF FRAMING: *T. L. Bank.*—According to this invention, metallic standards of a cruciform cross section are fixed in sockets and stayed by bars of T-section, and keyed or clipped together. This construction of wa



## CONTRACTS—Continued

*Those marked with an asterisk (\*) are advertised in this Number. Competition, p. iv. Contracts, pp. iv., vi., and viii. Public Appointments, p. xx.*

[illegible]



rd., u. 1. 69 yrs., g.r. 50<sup>1</sup>/<sub>2</sub>, 300<sup>1</sup>/<sub>2</sub>; l.g.r. of 27<sup>1</sup>/<sub>2</sub>,  
Dalston, u. 1. 15 yrs., g.r. 6<sup>1</sup>/<sub>2</sub>, 105<sup>1</sup>/<sub>2</sub>, 115<sup>1</sup>/<sub>2</sub>; 120, 21,  
Lambeth, u. 30 yrs., g.r. 16<sup>1</sup>/<sub>2</sub>, 135, 43, 1, 76<sup>1</sup>/<sub>2</sub>.

—By *Ellis & Son*: 5, Brick Hill Lane, Upper  
St. area 6,000 ft. r. 22<sup>1</sup>/<sub>2</sub>, subject to a deduction  
of 100 ft. for 100 ft. of 3 yrs., 2,350<sup>1</sup>/<sub>2</sub>. —By *E.*  
Stanhope-st., Hyde Park, 23 yrs., g.r. 15<sup>1</sup>/<sub>2</sub>,  
1,700<sup>1</sup>/<sub>2</sub>. By *H. Haldsworth*: 15, Olinda-rd.,  
Hill, u. 1. 85 yrs., g.r. 5<sup>1</sup>/<sub>2</sub>, 170<sup>1</sup>/<sub>2</sub>. —By *W. B.*  
15, 37, Bland-st., Brompton, West, u. 1. 41  
yrs., 75<sup>1</sup>/<sub>2</sub>, 550<sup>1</sup>/<sub>2</sub>. —By *Egerton*, 40, 41,  
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# The Builder.

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MAY 12, 1894.

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### The Royal Academy.



IN the case of the Architectural Room, so in that of the Royal Academy Exhibition generally, it may be said that while there is no work that can be named as of special and central interest, none to which everyone turns as a representative work, there is nevertheless great variety of interest in this year's exhibition, and a large number of works in which the aim of the artist is realised in a very successful and very striking manner. The exhibition is strong in landscape, and in this talk of art two or three well-known artists have either surpassed any of their previous productions, or have interested us very much by the treatment of remarkable and unusual subjects in nature. In the highest class of work, the treatment of ideal subjects in which the human figure is the principal medium of expression, the exhibition is not numerically strong, and it must be admitted that from painters from whom we are accustomed to expect most in this class of art we are not equal to their reputation, while on the other hand, we find some few examples of ideal art which exhibit unusual power both of suggestion and execution. There are some remarkable portraits, though the ill-health of Sir John Millais, which has prevented him from making any contribution to the Academy this year, is a serious loss. The same cause has deprived us, in landscape art, of any contribution from Mr. Adrian Stokes, whose landscapes have for some years past been among the most intellectually interesting paintings of this class. In sculpture we find a collection smaller than usual in number of works, the Academy having apparently decided on reducing the number of busts and smaller works which are generally crowded rather thickly round the walls, thinning their ranks and placing them on pedestals well separated from each other. The tendency to this reduction has been showing itself for a good many years. There was a time when the vestibule, from which all exhibits are now banished, was

always surrounded with a close phalanx of portrait busts (mainly), of no great interest to anyone except their authors and their originals; then this display was confined to the Lecture-room; and now the ranks of "wall-flowers" have here also been ruthlessly thinned. We scarcely think the public will regret this, though it is hard on the sculptors, to some of whom the admission of their works to the Academy is of considerable practical importance in that struggle for life which is perhaps a more severe and trying one among artists, until they have earned a generally-acknowledged reputation, than among most other professions. In one or two cases within our knowledge, also, and in others, perhaps, that we know nothing of, this more sparing apportionment of the available space has led to the exclusion of works which, though on a small scale, were of exceptional merit, and would have done honour to any exhibition. Of the works which are exhibited in sculpture, the standard is relatively high, though a certain air of repetition is given to this portion of the exhibition by the fact that the same central place is given to the bronze repetition of Mr. Fehr's remarkable group of "Perseus and Andromeda," which was occupied by the plaster version of the group last year. One or two other works appear in the same manner as bronze duplicates of last year's exhibits. The rule which empowers a sculptor who has made a success with a plaster model to exhibit the same design in monumental material the following year is a wholesome one—it is a worthy reward of ambitious and successful work; but it would be better in such a case to give the monumental edition of the work a new position in the rooms, so as to avoid the appearance of mere repetition, while giving the design also an additional interest in being seen under a new light and from a new point of view. On the other hand the Sculpture-room contains one very remarkable novelty in the shape of Mr. Gilbert's sketch-model for the tomb of the Duke of Clarence, to be placed in the Memorial Chapel at Windsor. This is a very original work of its kind, to which we will give more special attention when we come to consider the contents of the Sculpture-room; and perhaps if there were a work which could be selected from this year's exhibition as of especial mark it would be this; though the general public, who care for little or nothing but the pictures, of course will not take that view.

Of the type of ideal pictures which are called "classical" in subject the President of the Academy is, as usual, one of the principal contributors, but we cannot say that we find his works this year as interesting as they often are. "Fatidica" (20) and "The Spirit of the Summit" (190) appear to be experiments in the combination of full white draperies with cold leaden tones in the surroundings; in the first-named a large full-blown Greek woman, with a left hand and arm very finely drawn, sits enthroned in a niche built up of we know not what iron-grey material, it does not look like stone; in the latter picture the same woman sits on a peak of cold grey rock and gazes upwards, but not with any spiritual or aspiring expression in her face, such as might be expected in the spirit of the summit. The two pictures, however ideal in name, are prosaic in treatment, and the colour is depressingly cold. "Summer Slumber" (111), is as bright in colour as the others are dull; the nymph on the seat is gracefully designed, the whole reminds one a little of Mr. Albert Moore, with a harder texture. The small upright called "The Bracelet" (135), where a very tall woman stands amid a framing and background of columns and pilasters, is by far the finest work in harmony of colour and poetic suggestion, though it bears a much more prosaic title than the others. Mr. Poynter is at the head of the large gallery with an important work, "Horæ Serenæ" (163), where a group of long-robed damsels are dancing in the middle of a green flanked by two pavilions formed of wooden beams, supported on slender columns with gilt capitals, which have a curious resemblance to the common shape and treatment of cast-iron columns in modern building. They are, of course, intended to be wood; is there any authority for the introduction of columns such as these in what seems intended (from other accompaniments) as an ancient Greek scene? We do not count representations on vases, because we believe those are mere conventional indications of architecture, of no authority as to actual form and pro-

\* An illustration of this work, which has been purchased by the Academy from the Chantry Fund, is published in the present Number.



portion. For the title, there seems rather a dullness over the picture, a want of light on the grass; an effect arising perhaps from what is in one respect a merit, viz., the solid and uncompromising character of Mr. Poynter's painting. But a far finer work is the same artist's "Idle Fears" (253), an interior absolutely without subject, being merely a Roman bath-room in which a young girl who is rather afraid of the first plunge is encouraged or consoled by her mother; but as a moment of antique life recalled to us it is a picture learnedly painted and complete in every detail. One may question whether the child's legs are not a little thick and coarse in the lower portion. Mr. Alma-Tadema's most typical picture, "At the Close of a Joyful Day" (252), is appropriately hung next to this, and it is interesting to contrast the different method of treating marble surface and architectural detail in the two paintings. The latter shows the balustrade above the cornice of a white marble building—we see the cornice mouldings below the eye in receding perspective; a woman leans on the balustrade looking out on the sea; the thing is perfect as a picture, but unlike Mr. Poynter, the artist in the title of his picture makes an appeal to sentiment, and his figure entirely fails to illustrate it. We shrewdly suspect that many such titles are invented after the picture is completed, but surely this is a strange inversion of the higher and lower interests of art. When one thinks of all that might be expressed in a figure in meditation "at the close of a joyful day," and finds only an expressionless person leaning on a balustrade—a picture for which the title "On the Roof" would do just as well, and express all that there is in it, one cannot but wish that perfect power of execution oftener went hand-in-hand with the power of appealing to the perception of feeling and pathos.

Mrs. Normand ("Henrietta Rae") has taken a more important place than in any previous exhibition, with her large and very clever picture of "Psyche before the Throne of Venus" (564), a subject taken from Mr. Morris's "Earthly Paradise." The picture occupies a central position in Gallery VIII., and is a decided success in colour and grouping, though it is superior to some of its predecessors rather in size and elaboration than in higher artistic qualities. However, it is one of the central attractions of this year's exhibition, and not undeservedly. Mr. Abbey's "Fiammetta's Song" (797) may be grouped with this, and occupies an analogous position on the walls of Gallery X.; a Renaissance scene, fine in colour, peopled by abnormally tall figures.

Of that rare class of paintings—rare in this country—in which the expression of an idea is the paramount object, and which appeal to the thought as much as to the eye, we have a fine example in Mr. Watts's single figure, without background or accessories, entitled, "For he had great possessions" (259). It is, if we remember right, of a young man that this legend is told in the Gospels, and so far this bowed figure, retreating in perplexed thought, does not exactly illustrate the text, but it is a very fine and impressive work, in colour as well as in conception. So, in a lesser degree, is Mr. Henry Stock's "Death turning away from the innocence of a child" (398), and after Mr. Stock has been long trying at the Dudley Gallery to obtain recognition for purely imaginative work of this class, one is glad to find the most important work of the kind that he has done placed in a prominent position on the Academy walls. A smaller work by the same artist, "Sleep and Twilight" (794) is worth attention. Among legendary pictures we have Mr. Hacker's "Temptation of Percival" (154), in which the conception of "Satan's shepherdess" is admirable, though one does not see why Percival should be made to look so like a prize-fighter in armour; Mr. Briton Riviere's "Ganymede" (232), in which of course the main object is the painting of an eagle, but a new reading is given to the legend by repre-

sending Ganymede drooping passively, hung up in his waistband which has been clutched by the bird—a clever study of limp helplessness; and Mr. Swan's "Orpheus" (222), also of course an animal painting in all essentials. What a conception of Orpheus! A naked youth of scraggy figure dancing among a zoological garden of leopards and others of the "larger *felida*." If painters have no more imagination or poetic feeling to bring to the treatment of an ancient legend than this, why cannot they leave it alone, instead of dragging it down to the ludicrous merely to exhibit their own dexterity in a special phase of painting? Mr. Waterhouse's "Lady of Shalott" (245) is, on the other hand, a very well-studied illustration of Tennyson's poem, and a remarkably fine piece of colour; in colour, too, Mr. F. Dicksee's "The Magic Crystal" (218) is effective, though the picture is a little theatrical; and Mr. Boughton has given us a very pleasing study, half allegory, half reality, in his picture of "The Ordeal of Purity," in which a sweet Puritan-looking maiden, with a halo round her head, passes across the foreground of a landscape, jeered at by "certain ill-favoured ones" in the background. Mr. Herkomer paints another conception of purity in his life-size young woman in front of an extended rather too extended—background of foliage, "All beautiful in naked purity" (340); the only nude picture we remember from his hand. The picture justifies its title, except, perhaps, as far as the word "beautiful"; it is a very well-painted figure, perfectly free from affectation or false sentiment, but not particularly beautiful, and the head is deficient in nobility and expression; it hardly rises higher than being what French students call a "conscientious nude"; as such it is admirable; but the title given seems to promise rather more than we find fulfilled in the picture.

Of what we may call narrative or *genre* scenes—the class of works held in holy horror by the *fin de siècle* critic—there are not many examples that are specially striking. The ablest undoubtedly is "Gentlemen! the Queen?" (920) by Mr. Chevallier Tayler, who seems to be aiming at emulating in a sense a certain well-remembered picture of Mr. Orchardson's, though of course in a very different key and texture. The painting represents the officers of a mess, in uniform, standing with uplifted glasses, an interesting and spirited group, no doubt portraits; the mass of scarlet colour has been very skillfully handled. Mr. Lorimer makes a rather telling point in "The Eleventh Hour: Marriage de Convenience" (104), a hard and crude painting, however, in an artistic sense; Mr. Dicksee's "First Audience" (392), Goldsmith reading "She Stoops" to two ladies, is pretty and bright; Mr. Frank Bramley's "By the Light of the Fire" (539) is a fine and telling sketch of mother, grandmother, and child in humble life, the child especially good; Mr. Stanhope Forbes portrays "The Quarry Team" (461), a good study from life but not a picture; Mr. Dendy Sadler gives us another of his pleasant Darby and Joan type of scenes (888); W. W. H. Bartlett's "Now We Go Round" (410) is a good child picture. Historical and battle pictures are not remarkable this year; Mr. Seymour Lucas paints "The Call to Arms" (467), with a quotation from Macaulay's "Armada" poem, but the scene is not very real, nor do we by any means care for Mr. Prinsep's large hard painting (277) of the march of the women to Versailles. Mr. Caton Woodville's "Badajos" (441), the scene at the breach on the morning after the storming, is carefully studied in details, but spoiled by the figure of Wellington, a tall, thin, grizzled man of apparently about sixty. If the artist looks up dates he will find that Wellington was forty-three at the time of the taking of Badajos, and there is certainly no record that he was a man who had aged prematurely.

High up against one ceiling of Gallery V. is a great erection representing a portion of an arched ceiling and lunette underneath forming "part of a mural decoration for the Public Library of Boston, U.S.A." (423), accompanied in the catalogue by a quotation from Psalm CVI., commencing "they forgot God their saviour . . . and they served idols which were a snare unto them," &c. In its present position and lighting it is difficult either to understand the treatment of a large work or to judge of its effect. It appears to be an allegorical representation of Egyptian Paganism, treated in a completely decorative manner, with a great deal of symbolical ornament partly applied in gilt relief. It appears to be a powerful piece of work of its kind, and it is somewhat astonishing to find attached to it in the catalogue the name of Mr. J. S. Sargent; perhaps the last name that any one, judging by the character of the work, would have thought of connecting with it.

Among the more noticeable portraits of the year is Mr. Oule's fine half-length Sir Francis Grenfell (15), a model of the portrait pure and simple, without any attempt at effect from accessories. Mr. Sargent's "Miss Chanler" (61) is an effective portrait rather wanting finish in detail, the modelling of the face and hands is unsatisfactory. In this respect it may be compared with Mr. Shannon's "Mrs. Claude Magniac" (129), which the hands and face are most carefully painted and the expression admirably given—a portrait really conveying character. Mr. Fildes's portrait of the Princess of Wales (239) is finished with the greatest care, perhaps almost over-finished, and a little heated in colour; still, it is a remarkable work of its type, an ornament to the portrait rather than in the highest sense an artistic one. Mr. Furse's "Mr. Robert Bridges" (216) is an example of the opposite school, and it somewhat defiantly forcible is at any rate full of character. Mr. Orchardson, who does not do much work of the year, has an excellent portrait of Professor Devar (176), and Mr. Solomon a rather sensational one of Mrs. Patrick Campbell (Mrs. Tanqueray) (402), a portrait painted with effect in regard to colour and surrounding; the head seems rather hard and flat, and deficient in modelling and texture. Mr. Hacker sends an admirable three-quarter length of Mr. Onslow Ford (440).

Among landscapes, as we have already observed, there are a good many fine works of which we can only mention some of the most important. It is curious to compare the various theories of landscape-painting which are, intentionally or otherwise, illustrated in the works of different artists. Mr. H. W. B. Davis, for example, in his beautiful little work "Al Fresco" (140), practically takes landscape-painting as the complex representation of a scene in nature with its colour and detail. This work, a corner of a wooded pasture with a stream and some sheep, is almost as remarkable for its success as his country lane of last year; it looks as if one could walk into it. Mr. Hope McLachlan's "Winter Comes" (397) might almost be called smudge in comparison; yet it gives the poetry of the wintry scene very powerfully. Mr. Davis's "April Afternoon" (26) is another beautiful little work in his usual style; his "First Breath of Autumn" (324) is in a fuller and broader style, and suggests the intended idea very finely. Mr. Hook has left the sea and gone up to the country. His "Seed Time" (55) is a fine work, though the landscape seems to rather to want light. Mr. MacWhirter has sunshine enough in his "Flowers of the Alps" (196) a brilliant piece of foreground with a mountain landscape, and Mr. East in "A Sunlit Harbour" (364), has had a splendid success in painting a wide scene full of air and sunlight, perhaps wanting a little more force in the foreground. Mr. Parsons's "Sunset after Rain" (417) is one of the experiments of the year, a very strong sunset light.



with an expanse of vegetable fields in the foreground, which show with very decisive though subdued colour in the wet. The picture is a bold grappling with a remarkable effect of light and colour, very difficult to render in painting. Mr. David Murray's "Peace at Eve" (558) is rather a tangle of trees and underwood, cottages and distant castle, and does not harmonise very well with its title; his larger work, "Long After" (585) is a fine landscape. Among sea paintings Mr. Wyllie perhaps heads the list this year with his beautiful small work, "The Roaring Forties" (4), though he does not exactly represent the peculiarly large and extended swell of the sea which we are told by sailors is characteristic of that latitude. Mr. Brett, in "The Promise of a Wild Night" (534) repeats to some extent a fine effect of last year, an expanse of rather shallow landward sea covered with crests of breaking waves, giving the idea of a picture full of the sound of waves; the conditions of light are, however, quite different from those of last year's picture. Mr. Moore exhibits his diploma work, "A Summer Breeze in the Channel" (705). Gallery No. V. contains various moonlight pictures, of which Mr. Barlow's "Moonrise" (335) is the best, partly because he has not attempted to put too much light and colour into it, as painters of moonlight too often do.

Architecture comes into a good many pictures this year; among others celestial or dream architecture, in Mr. Goodwin's curious picture of "The First Christmas Dawn" (385), in which the angels appear to the shepherds out of a vast blue shadowy cathedral filling all the sky, and far too closely imitated from actual Gothic architecture for such a subject; one can almost place the style and the mouldings of the edifice: it should have been more abstract and ideal. Mr. Leader has painted a large view of Worcester Cathedral (371), very hard, but not without its effect; Mr. Yglesias contributes a rather fine picture of Lincoln (27); Mr. C. E. Johnson a very fine one of Salisbury (278), in which the Cathedral, in full sunshine, makes a central object in the middle of a large landscape, somewhere after the manner of Constable; and Mr. Woods contributes a splendid little picture of the Colleoni Statue at Venice (250), with some of the surrounding buildings, which it would be difficult to surpass for brilliancy of effect and truth of colour in the pictorial treatment of architecture.

The sculpture we will notice separately on another occasion.

#### THE MEAT MARKET COMPETITION, BIRMINGHAM.

THE thirteen sets of drawings exhibited this week at the Birmingham Council House are the work of local architects and show a knowledge of the specialties of markets and slaughterhouses which is the result of the careful study of the subject by the Market and Fairs Committee of the Birmingham Corporation, who collected valuable information for the competitors before inviting designs. The site is almost rectangular and bounded by Cheapside on the south-west, Sherlock-street East on the north-west, and Bradford-street on the north-east. In all the plans the general disposition is the same, the result of the suggestions of the Committee. The meat-market occupies the central portion of the site, and runs through from Bradford-street to Cheapside, the slaughterhouses for the wholesale trade are in the Sherlock-street side, and those for the retail trade on the opposite side of the market, from which they are divided by covered roadways running from end to end of the site, that is from Bradford-street to Cheapside. Most of the competitors appear to have found the arrangement of the wholesale side comparatively easy, and the points of difference between the various designs are chiefly centred in the arrangement of the retail trade and in the details.

The first premiated design, by Messrs. Essex, Nicol, & Goodman, shows a very careful and thorough study of the authorities and best existing examples to which competitors were referred by the Market Committee, and far excels all other designs submitted in the thoroughness with which is kept in view the fundamental principle that no animal should ever retrace its steps, whether alive or dead, from the time it enters the premises till it is hanging ready for sale in the market. It is only by a rigid adherence to this principle that order can be maintained in a public abattoir during busy times, and yet in many of the designs this requirement is so far overlooked that sheep going to slaughter would meet pigs and beasts going to the lairs, and endless confusion would ensue unless the use of the premises were very much restricted. The amount of accommodation required for the retail trade somewhat hampered the competitors in their arrangement, as the space available was much restricted, and it is in this part of the plan that most of the competitors fail.

In the first premiated design, one of two alternatives submitted by Messrs. Essex, Nicol, & Goodman, the wholesale slaughterhouses are arranged in the universal position, with entrance for animals from Sherlock-street. The lairs for the animals are above the slaughter-houses, and the fodder-store in a mansard roof above the lairage. The fodder-store is of fireproof construction. The tripery and offal-cleaning department is at the north corner of the site. It is in the arrangement of the retail side that this design pre-eminently excels. The animals enter from the south corner of the site in Cheapside, and immediately on entering the three classes, beasts, sheep and calves, and pigs take a separate route. The beasts go by their inclined plane up to their lairs, the sheep and calves by another plane to theirs, the lairage for each being immediately over their slaughter halls. When required for killing, these animals descend by a separate route to the small pens outside and close to the points of slaughter. In the slaughter halls, the animals, after killing, are hung to hooks which, by an ingenious and well-arranged system of overhead rails, enable the carcasses to pass from the slaughter halls to the covered or carcase roadway, then to the lifts which are next the roadway and convey the carcasses to the chill-rooms in the basement or lower ground floor under the market, whence they are returned to the market, and still travelling by the overhead rails, are taken to their place of sale. The pigs have their lairage and slaughter-hall close to the Cheapside entrance on opposite sides of the courtyard or roadway, which, 20 ft. wide, runs down the centre of the retail slaughter-houses, and, after passing the pigs' department, separates the slaughter-halls for sheep and beasts, but being on a lower level, communicates with the lower ground floor, in which are blood separation and manure machines, stores for hides, skins, fat, &c., quarantine, diseased meat slaughter-house and destroyer. The pig offal cleaning department is next the pig slaughter hall and at the Cheapside end of site, the tripery and offal cleaning rooms for the other animals at the Bradford-street end. A feature which is worth noticing in the retail trade accommodation is the arrangement for butchers' carts, which enter from Bradford-street and pass in a regular stream either along the carcase roadway between the market and the slaughter halls for beasts and pigs, or by a branch roadway to the killing side of the slaughter hall for sheep, rejoining the carcase roadway by a bridge over the court-yard. The planning of this retail trade department is very ingenious and skilful, and gives the maximum accommodation and a well-ordered arrangement. The alternative design by the same authors is decidedly less skilful in this respect, and appears to solve the problem by giving less accommodation. The market-hall in the selected design is 40 ft. high, and is side-

lighted from the walls, and by side-lights in a continuous lantern on the roof. To exclude the rays of the sun the eaves of this lantern-light project 4 ft., and those of the main roof 5 ft. In the alternative design a saw-back roof is shown, the lighting being wholly from the north, through vertical faces. The chill-rooms are constructed with hollow walls, packed with silicate cotton; whilst the floor and ceiling are of hypocaust construction, through which cold air is forced by a fan. The exterior is picturesquely grouped, and is said to be Spanish Renaissance, but the detail on the 1/4 scale drawings is, naturally, not sufficiently clear to enable us to pronounce any definite opinion. The street fronts are intended to be carried out in red brick and buff terra-cotta, and the cost is estimated at 47,000*l.* In the alternative design the design of the Birmingham Law Courts has evidently been laid under contribution, and the elevations are certainly superior to those of the selected drawings, which, however, are superior in plan.

The second premiated design, by Messrs. Cossins & Peacock, is in its main lines similar to the first but differs in the arrangement of the retail side; the slaughter hall for beasts is nearest to Cheapside, then comes that for sheep and calves, whilst the pigs are accommodated at the Bradford-street end. The lairage is above the slaughter halls, but the access thereto is not, by a great deal, so well managed as in the first design. The chill-room is under the market, but the lifts to the same are actually within the market, a questionable arrangement, as carcasses have to pass through the market to reach the chill-room. The lighting of the market hall is arranged by constructing the roof on the ridge and furrow principle, with a series of steep mansards of about 18 ft. span each, running transversely across the hall and lighted only by windows on the steep slopes on north side. This effectually keeps out the direct sun rays, but hardly gives so much light as is desirable. The elevations are quiet and suitable in design, of a Renaissance character, and are intended to be carried out in red brick and terra-cotta. The cost of the design is estimated at 43,000*l.* The design, as a whole, worthily occupies the second place, though it is clearly inferior to the first premiated.

The third premiated design, by Messrs. Bateman & Bateman, suffers somewhat from hasty draughtsmanship, but, even making allowances for this, is as distinctly below the second as that is below the first. This, notwithstanding the plan shows careful study and good arrangement; but the slaughter-halls for the retail trade are too square and therefore too wide, a disposition which is less convenient for working, and less satisfactory in lighting than the narrower type adopted in the first and second premiated designs. The square shape also leads the authors into difficulties with the pens in which the animals await their final moments, and which it is desirable, if possible, should be close to the hand of the slaughterer. The pig lairs are arranged in a long single row, so that some of the pigs would be a considerable distance from their slaughter-hall, and affairs would be somewhat mixed if pigs, sheep, and beasts were all going to slaughter at the same time. The lifts to cold stores or chill-rooms are, in this plan, in a good position. The method of lighting for the market-hall is somewhat similar to that adopted in the first premiated design, and makes use of glass *louvers* and windows in the side walls, with wide eaves to keep off the sun's rays.

Taking the remaining designs in the order in which they have been numbered on reception (mottos being forbidden), we find designs Nos. 1 and 2 have very fair plans, but the accommodation seems to have been cut short. No. 3 has the exceptional arrangement of lairage for the retail slaughter halls in the basement, instead of above, as in most designs, and as is adopted even in this for the wholesale



trade. The upper position seems to be the better, as animals usually go to the lairs in larger numbers than from the lairs to the pens, and it is easier to drive a large number of restless animals upstairs than a small number of animals who have been within smell and hearing of slaughter for some time. No. 6 has the best drawn elevations in the room, and is a pretty design in Spanish Renaissance duly studied from Mr. Prentice's book. The plan is indifferent, although the authors state that they have visited all the buildings in England and Germany mentioned by the Committee. The most remarkable feature in the design is the idea for the market hall roof, which is beneath criticism, and can only be described as an unsuccessful attempt to design a hammer-beam roof (with tie rods) in iron and late Spanish Gothic. In No. 7, as in the third premiated design, the retail slaughter-halls are too square, and hence, also, the pens are not conveniently arranged. No. 8 is a fair plan, but is handicapped by the running of the overhead travellers not being shown, this being an item that is very carefully studied in all the premiated designs. The author of No. 10 is a man with an idea which he thus expresses in his report—"The market and covered cart roadways are roofed in one span, without any division walls between the roadways and stands, and the design is submitted on these lines." Quite so, and these lines are, in the opinion of the assessor and of market designers generally, wrong lines, so that the design is at once out of court. No. 11 is a plan on good lines, and shows an adequate knowledge of the subject, but is crippled by the inclusion on the ground floor of several things which might have very well been located in the basement, or, as in the first premiated design, a lower ground floor. The elevations show diligent study of the new Law Courts of Birmingham, which evidently are in danger of receiving from Birmingham architects the most sincere form of flattery. No. 12 is also the design of a man with an idea, which is that intestines, hides, skins, and other non-edible portions of the animals should be removed as quickly as possible, and they are therefore sent down numerous shoots to the subway in basement from the slaughtering points, but after this it is somewhat surprising to find the tripey mixed up with the animals' entrance. The plan is, nevertheless, in its main lines good, and the elevations are pleasing.

In conclusion, we can congratulate the architects of Birmingham on the skill with which they have dealt with a very unusual problem, and the readiness with which they have assimilated the information prepared for them by the Market Committee. It is, indeed, little short of astonishing that there are few plans submitted which are weak in arrangement, and none which are absolutely bad. At the same time it is beyond question that the first premiated design is head and shoulders above all others, and the Corporation may rest assured that they have lost nothing by limiting the competition to their own townsmen.

#### NOTES.

**L**ORD ROSEBERY'S speech at the Royal Academy dinner on Saturday last was rather more that of the humourist than the Statesman, but it was one which may perhaps emphasise the dislike of all men of taste to various things which offend against the teachings of art in daily life. Lord Rosebery took up his parable very effectively against the advertising nuisance, against the huge and hideous advertisements which disfigure the country districts, and even threaten the sea itself. Nor did he spare the Eiffel Tower that is to be, "the enterprise of a great speculator," as he termed the last undertaking on which Sir Edward Watkin has set his heart, which will even spoil the

beauty of the heavens. It is to be hoped that so public a criticism from so prominent a personage of this particular phase of modern business, which has culminated in the advertisements which disfigure meadow and croft amidst the most charming scenery, will induce some landowners to raise their terms for the permission to erect these advertisements, and in some cases will cause others to withhold their permission altogether. It is difficult to say that the impoverished agriculturist shall not turn an honest penny if he can, but the amount which he receives as a rule for these advertisements is really scarcely worth taking into account, from a business point of view, and it is to be hoped that he will now see the error of his ways, and take more pride in retaining the beauty of English landscape in this respect than he has hitherto done.

**A** COMMITTEE of architects has been formed at Athens to consider the best means of repairing the damage done by the recent earthquakes to the antiquities of the city. This, we learn from a letter written by Mr. Lambros to the *Athenaeum*, has been considerable. The monument of Philopappos has been badly shaken, a huge block has fallen from the Gate of Hadrian, and a capital from that of Athene Archegetis. Worst of all, some columns of the Parthenon have suffered. The moral must obviously be drawn that as the marbles of the Parthenon are in a comparatively safe place we had better keep them there, and not return them while their country is liable to these seismic commotions. We are glad to hear that the Archaeological Society has generously offered to bear the whole cost of repairs, though, indeed, this might well have been an occasion for a national or even European subscription.

**T**HERE has recently been more than one case in the Law Courts in reference to the drainage and sanitary state of dwelling-houses. These decisions we have not referred to, since from time to time, on previous occasions, when similar disputes have arisen between landlords and tenants, we have had something to say on this subject. But at the present time of year, when, according to the practice of the period, it is usual for so many families to become temporary occupants for part of the summer of country houses and seaside villas, it is opportune to refer again to the subject. These later cases, as well as others which have been decided, during the past year or more, emphasise the absolute necessity, if a would-be tenant wishes to safeguard himself against danger from bad drainage, of a proper survey by a competent person. To trust to the assertions and the statements of landlords and their agents is no real safeguard. Even if a landlord so commits himself by statements of fact which prove to be untrue as to enable a lessee to bring an action against him with success, yet this is a barren satisfaction. Health may be injured and money lost even if he is the victor in a law-suit. But a careful survey is a prevention against loss of health and of money, and a safeguard against litigation, since if the survey is not satisfactory, the would-be tenant need have no more to do with the house. We fear that in many cases a man has so strong a desire to become the occupier of this or that house that he allows his inclination to overcome his judgment; he almost prefers that no sanitary drawbacks should be pointed out, and he hushes his sanitary conscience by telling himself that there is no appearance of anything being wrong. But we repeat that no prudent man will become the tenant of a country house or a seaside cottage until it has been ascertained that it is in a proper sanitary condition.

**A**S in this country, the first week of May brings with it a large number of Continental Art Exhibitions. There is a very strong one at Antwerp in connexion

with the International show opened there on Saturday last; then there is the annual one at Berlin, which is considered to be above the average, and to have an unusually well-stocked Architectural Room; and we find another at Milan, curiously enough associated with a Wine and Sportsman's show. To some of these—so far, at least, as the architectural exhibits are concerned—we may have an opportunity of referring further.

**A**T an autumn meeting of the Hellenic Society, Mr. Arthur Evans, it will be remembered, astonished those present by the sudden announcement that he had discovered an entirely new form of Greek writing. It occurred on a number of lentoid gems which he hoped shortly to be able to decipher. This week the *Times* reports that Mr. Evans has discovered in Central Crete traces of Mycenaean writing which are closely analogous to the Hittite and pictographic system, and also of another system which seems nearer to the Cypriote alphabetic method. We seem on the eve of great palaeographic discoveries. But the discoveries at Crete are not confined to inscriptions; Mr. Evans has come upon the sites of two primæval cities of Mycenaean type, one with an acropolis, and a grove with votive offerings, the other, at Goules, with stupendous ruins and the evident remains of a Mycenaean palace. The riddle of Cretan, it may be Mycenaean, civilisation may, perhaps, soon be read.

**T**HE peplos of Athene will not let the archaeologists sleep. A few weeks ago we published a detailed *résumé* of Dr. Fürwangler's theory on the central slabs of the eastern frieze, noting that he returned here, as elsewhere, to the old conservative view, though with new additional arguments. He held, as the British Museum authorities have always held, that the slab represents the presentation of the peplos, not merely the deposition of the priest's garment as a preliminary to sacrifice. The fact remained, however, that if so, one god present and Athene herself, chief and nearest, is turning her back on the ceremony. In the last number of the *Classical Review*, Mr. G. F. Hill suggests a new and certainly interesting solution—the garment is, he thinks, the peplos, but it is the old peplos being taken away before the coming of the new robe. The new robe is being brought by the advancing procession. Quite fitly the gods turn their backs on the old robe, the old year, and look to the new—*Le roi est mort, vive le roi*. We are sorry that Mr. Hill supports a view so original and brilliant by an argument both stale and, we think, stupid, i.e., that the new robe is not represented in the procession, because out of keeping with the frieze as a Greek artist would compose it. If a Greek artist could not "compose" a peplos carried on a ship-car the sooner he stopped composing the better.

**I**T is stated that Lord Armstrong has bought Bamfargh Castle from the trustees of Lord Crewe's Charity, meaning to establish therein a home for poor gentlefolks, which he will endow with 20,000*l*. Thus will "King Ida's Castle, huge and square," return to the uses which it served in later years upon the foundation of Nathaniel Lord Crewe, Bishop of Durham, who died in 1720. This famous stronghold is believed to have been originally erected by Ida, first King of Bernicia (547-60), over the site of a fortress planted by Agricola in his third campaign. Bede records its capture and overthrow by Penda, King of Mercia, who slew Oswald in battle (642), and says it was named after Bebbha, consort of Ethelfrith the Fierce, King of Bernicia (593-617). Having been destroyed by the Danes in 993, it was rebuilt, *temp.* William II., by, as is commonly supposed, the Earl Mowbray, and completed with outworks and two gate-towers in Henry II.'s reign. The keep, in plan and design, is very similar to that



Dover; a survey of 1574 describes it being about 25 yards square. Its north wall is 11 ft. thick, the three others being 9 ft.; all the rooms but one were lighted openings barely 6 in. wide, it had no chimney, and the roof, since raised, rested on the second floor. The materials were all stones brought from a North Sunderland quarry, three miles distant. In 1770 it was found the draw-well which Hoveden mentions, sunk through the rock and instone, like that at Beeston Castle,eshire; in 1773 they discovered the Peter's Chapel at the south-east angle of outer ballium, its chancel, with rounded arch, being 36 by 20 ft., and the nave 100 ft. long. After the battle of Hexham Bamburgh suffered to fall into decay. Having been sold to the Forster family by grant of Henry I. it was forfeited in 1715 by Thomas Forster, the Jacobite, whose uncle Nathaniel, d. Crewe, bought it, and vested it in trustees for various charitable purposes—including schools for boys and girls, a workhouse, an infirmary, and a shipwrecked sailors' refuge. Lord Crewe's charity was valued at an income, in all of about 9,000l. a year, and has lately been remodelled by the Charity Commissioners. Dr. John Forster, archdeacon of Northumberland, and one of the first trustees, began a series of the buildings in 1757, and much has been done since to adapt them for occupation by the Crewe trustees, as well as for general objects of the former charity. John Forster was Governor in Queen Anne's reign. His descendant, whom his daughter Dorothy helped to escape from Newgate, was buried (1738) in the graveyard of St. Aidan's Church, Bamburgh, where, too, the monument to Grace Darling and her mother. The keep, placed on a triangular rock of basalt, overlooks Farne Islands, to the left are Holy Island or Lindisfarne, on the right are seen Dunstanburgh castle and its caverned shore.

At the last monthly meeting of the Metropolitan Public Gardens Association it was announced that the laying-out of the churchyard of All Hallows, London-wall, was completed, and it was agreed to continue negotiations for acquiring, on behalf of the Association, the Friends' Burial Ground, Bermondsey, the churchyard of All Hallows the Less, near Thames-street, and Bessborough-terrace, Fimbo. The site of All Hallows the Less, which was not rebuilt after the fire, has of late years been occupied by Calvert's, since the City of London, the churchyard lies between Red Cross-yard and the church of All Hallows the Less, on the south side of the street. Stow says that the steeple and choir of All Hallows the Less (also known as the "Cellars") stood "on an arched platform, being the entry to a great house called Coldharbour." The Cold Harbour is a conspicuous feature in many of the old views of London, and had belonged to Sir John Abel, temp. Edward II., to Sir John Poultny, in the next reign, and to the Crown. In 1485 Richard III. gave it to Herault's College; his successor gave it to George, Earl of Shrewsbury; it belonged for a while to Tunstall, Bishop of Durham, it was given by Cardinal Beaufort, six days before his death. Francis, fifth Earl of Shrewsbury, the brewery stands on the site of Coldharbour. Of All Hallows, London-wall, we have a description in a "Note" on June 8th, and, on April 25, 1885, a copy of it, and of Toms's view (1740) of the old church; the present edifice was built in 1747 after the designs of George Dance the younger. We therefore will only add that 150 years ago was announced the discovery

of the site of Watermen's Hall. In Cold Harbour-lane, wall, was a half-timbered house, the guild house of the Port of London pilots, temp. Elizabeth. Some would give the name from the station of a Roman serpent, and, *colibri arbor*. See the *Builder* of 28th ult., and "Ancient Crypt," for Sir John Poultny, and the Rose on the north side of Upper Thames.

in an old chest, in the vestry, of a parcel of churchwarden's accounts with entries beginning in the reign of Henry VI.

AN interesting communication has just been made to the Iron and Steel Institute by Mr. Jeremiah Head, C.E., giving some account of the rise and development of the Swedish iron ore trade, and its bearings on the future of the iron industries of this country. Twenty-five years ago, he remarks, our ships, bridges, boilers and railway-tracks were made of iron derived almost entirely from British ores. Now almost all these are made of steel derived from Spanish ores. Hence he becomes an alarmist, and asks what will happen if the Spanish Government lays a heavy export tax upon ore, or if the supplies are prevented from arriving in Great Britain in consequence of the operations of war, &c., &c., and concludes by advocating the further utilisation of the iron ores of Scandinavia as a species of counterblast. This is all very well so far as it goes, but Englishmen have hitherto received but little encouragement in Sweden in the direction indicated. We are quite at one with the author as to the magnitude and importance of the iron ores of Gellivara, Kiruna, Luossavara, Svappavara, and some other places mentioned, but we do not forget the fate of the English company which opened up Gellivara, in Swedish Lapland, some seven years ago, and which shortly afterwards had to suspend operations. It is true that this failure might, in some measure, be attributed to mistakes in mixing together the iron ores of the various quarries instead of carefully classifying them according to grades; but we feel equally certain that it was still further due to the determined opposition of the Swedish authorities, who did all they possibly could to hinder the enterprise. As Mr. Head remarks: "The Riksdag and the people generally had never looked with favour on the acquisition of property rights in their country by foreigners." The Swedes are very wary; it has always been their policy, whether with iron or other mines, or quarries, to prove the practicability of an enterprise with British capital, and then, whenever possible, to debar proper development, with an ulterior object. There are some notable exceptions to this, especially where the intruders possessed much capital, or, what was better, political influence. Mr. Head does quite right to point out to us the yearly increasing iron ore exports from Sweden to Great Britain, and few possibly suspected they were as large as he indicates—35,601 tons in 1893, with a prospect of 130,000 tons in the present year. All the same, this is but a small proportion of our total imports of that mineral, which annually amounts to between 3½ and 4 millions of tons. As a communication is useful enough, but much of it is ancient history to those conversant with the iron industry of this country. It is a splendid advertisement (though evidently not so intended) for the "powerful Swedish predeceator" raised on the ruins of its British predecessor at Gellivara. In regard to the occurrence of phosphorus in these ores, we note that the report of the Swedish Commission of 1875 is quoted at some length. A much more exhaustive account of the apatites (phosphate of lime) of the Gellivara region has since been published,\* to which, however, the author does not refer. Towards the conclusion of his paper, Mr. Head alludes to the iron ore deposits of Norway, and the influence they might possibly exert on the Cleveland market if found to occur in sufficient quantities; he also gives an account of his personal examination of some iron ore deposits in various parts of Norway. The Norwegian concessionaires, he says, "generally lack the means to develop, or even to prove, their properties. Unlike the

\* "Apatitföremålet i Gellivara Malmberg och kringliggande Trakt." Af H. Lundbohm. Stockholm, 1890. (Swedish Geological Survey Publication.)

Swedes, they are anxious enough for Englishmen to come with capital and skill to buy and work their concessions." No doubt they are; but in view of recent experiences in the development of iron ores with British capital in Scandinavia, we think the bait held out is hardly attractive enough for English ironmasters.

IT is doubtful if existing Highway Boards and Parish Surveyors sufficiently appreciate the force of the eighty-second section of the Local Government Act, 1894, which is likely to put many highway areas where the roads have not been well looked after to considerable expense. By the above section it is enacted that the District Council (which is the new highway authority) may determine that the highways of a parish or area shall be placed in proper repair before the expenses of repairing the same become a charge on the new district, and if they are not placed in repair to the satisfaction of the District Council, the latter body may put the highways in proper repair, and charge the cost of so doing on the defaulting parish or area. Any question as to the propriety of such a charge, if there is a dispute, must be settled by the County Council. It is obvious that whether a District Council be energetically disposed or not it will certainly cause the highway authority which it supersedes to do everything that is necessary to place the roads in as proper a state of repair as possible, since by so doing the unpopular course of causing increased expenditure will be put on the shoulders of the outgoing authority. We may, therefore, expect that this section will be stringently enforced, and it is desirable that highway authorities should not lose any opportunity between now and the time when the new authorities come into power of placing the highways for which they are responsible in good condition.

TWO small exhibitions of pictures are now being held at the rooms of the Fine Art Society in New Bond-street—a collection of pictures and drawings illustrating military England of to-day, by Mr. J. P. Beadle, and a small series of water-colours of Venice by the late Mr. C. E. Herne, supplemented by a considerable number of pictures given by well-known artists, members of the Royal Anglo-Australian Society, towards a fund now being raised for the widow and children of the deceased artist. Mr. Herne's drawings show a great deal of careful draughtsmanship, and a close acquaintance with architectural detail, although the general effect of many of the drawings is somewhat hard. Mr. Beadle's military drawings are excellent, both as studies of uniforms, horses, and figures, and in many cases the landscapes in which they are placed are very freshly painted, and give an air of actuality to the whole which much enhances their value as pictures, apart from their value as studies in costume. The large drawing at the end of the room (27), "Her Majesty's Life Guards," (14) "The Recruit," (17) "A Quiet Pipe," (34) "The Queen's Guard," and (44) "A Regiment on the Road," are all well worth careful examination.

THE SURVEYORS' INSTITUTION.—We are asked to mention that the following, among others, will be present as official guests at the Surveyors' Institution dinner on the 28th inst.:—The Duke of Devonshire; the Earl of Jersey; Sir William Grantham; Judge F. Meadows White, Q.C.; Sir E. Lechmere, Bart., M.P.; Sir R. E. Webster, Q.C., M.P.; Sir Walter Foster, M.D., M.P., Parliamentary Secretary of the Local Government Board; Sir Courtenay Boyle, Secretary of the Board of Trade; The Right Hon. Jesse Collings, M.P.; Mr. F. A. Channing, M.P.; The Chairman and Chief Officers of the London County Engineers; and the President of the Institution of Civil Engineers; and the Comptroller of the City of London. The presentation to the Secretary will take place at the dinner.

MENAI BRIDGE.—This celebrated bridge is at present being new-paved with asphalt, by the Limmer Asphaltic Paving Co., for the Office of Works.



## THE ROYAL INSTITUTE OF BRITISH ARCHITECTS:

## THE ANNUAL REPORT.

The annual general meeting of the Royal Institute of British Architects was held at No. 9, Conduit-street, on Monday. The annual report of the Council, which was adopted, contained the following passages:—"Since the issue of the last annual report, May 4, 1893, twenty-eight meetings of Council have been held—two by the Council of the year of office expiring June 5, 1893, and twenty-six by the Council elected on that date. Committees of the Council have also sat for the consideration of matters connected with professional practice, finance, alliance with non-metropolitan societies, and the award of the Royal Gold Medal.

During the same period 19 Fellows (of whom 10 were previously Associates) and 68 Associates have been elected, as against 40 Fellows and 57 Associates in 1892-93. The class of Fellows now numbers 621, as against 623 at the date of the last report; and the class of Associates 846, as against 814. Three Hon. Associates—namely Alexander Wood, M.A., J. O. Surtees Elmore, M.Inst.C.E. (Kapurthala, Punjab), and J. R. Bramble, F.S.A. (Somerset)—have been elected, and 1 Hon. Corresponding Member, the Commandatore Rodolfo Lanciani (Rome).

The losses by death have been as follows:—A. H. Edmonds, W. H. Ellerker (Melbourne), William Haywood, Andrew Heiton (Perth), James Maxwell (Manchester), and J. B. Mitchell-Withers (Sheffield), Fellows; C. W. Chapman, Philip Curry (Lewes), Samuel Hill, Alfred Lovejoy, W. John Mettam (Leeds), F. M. Risbee, and Caleb Stanger, Associates; C. B. Birch, A.R.A., Lord Crewe, Lord Hannen, Thomas Hawksley, F.R.S., and H. Clifford Saunders, Q.C., Hon. Associates; Henry Clutton, Retired Fellow; and César Daly (Paris), Carl von Hasenauer (Vienna), and Heinrich Lang (Baden), Hon. Corr. Members.

Preliminary examinations were conducted simultaneously in London, Bristol, and Manchester in November, 1893, and in February, 1894, and the 136 successful candidates have been registered as probationers. Intermediate examinations were held in London on the same dates, and of the 55 probationers who presented themselves 36 passed and have been registered as students. The total number of probationers now on the register is 559, and the total number of students 105. Examinations to qualify for candidature as Associate were held in London and Manchester during the week commencing November 27, 1893, and in London, Glasgow, Bristol, and Manchester from March 5 to 10, 1894, with the result that of the 150 candidates who attended 63 passed.

The Asphit Prize was awarded to Mr. Ernest Robert Barrow, as having most highly distinguished himself among the 73 gentlemen who (out of 142) passed the examination qualifying for candidature as Associate in the Calendar year 1893; and two others, Mr. E. E. Fetch (Cambridge), and Mr. Inglis (Edinburgh), received subsidiary prizes.

The Council again desire, in the name of the Institute, to record their indebtedness to the officers and other members of those allied societies under whose charge examinations have been conducted during the official year; and their great sense of obligation for the services rendered by the chairman and members of the Board of Examiners. No statutory examinations have been held during the official year, only one application to be examined under the provisions of the Metropolitan Building Act 1855 having been received.

The Royal Gold Medal (1893) for the promotion of architecture was awarded to Mr. Richard Morris Hunt (Hon. Corr. M.), of New York, for his executed works as an architect, on June 19, 1893. The proposal of the Council to present the Royal Gold Medal for the current year to the President of the Royal Academy, Sir Frederic Leighton, Bart. (H.A.), confirmed by resolution of the Institute on March 12, 1894, has been graciously approved by Her Majesty the Queen.

The standard of work sent in for the various prizes and studentships 1893-94 compares not unfavourably with that of former years.

Selections from the prize drawings, and specimens of work sent in by applicants for admission to the Preliminary Examination and of Testimonies of Study submitted by candidates for the Intermediate Examination, were forwarded for exhibition to the allied societies. . . . These drawings have been on view at Leicester, Man-

chester, Sheffield, Nottingham, York, Leeds, Newcastle, Glasgow, Dundee, and Liverpool, under the charge of the allied societies of those centres, a period of about a week being allowed to each. . . .

By-laws 7, 8, & 9, as modified by a resolution of the Royal Institute on March 27, 1893, and confirmed on April 17 following, were duly submitted to the Privy Council, were approved by their Lordships as amended on August 7, 1893, and the same have since been incorporated in the by-laws and published in the "R.I.B.A. Calendar" issued last October. In respect to the late election by voting papers, under By-law 9, the Council regret the result, and cannot avoid the expression of their opinion that grave injustice was done to some of the candidates for fellowship.

A proposal by the Council to so modify by-law 25 as to permit every allied society to be represented thereon, having been submitted to a special general meeting of the Royal Institute, was considered and referred back for further consideration. The Council consequently appointed a committee, consisting of the President, Mr. Arthur Cates, Mr. Edwin T. Hall, and Mr. Wyatt Papworth, and received from them a report which was approved and adopted, and by the terms of which the representation in London of such allied societies will be regulated by the Council as follows:—

A. The Presidents of the largest societies most identified with the R.I.B.A. should annually be nominated to the Council.

B. The Presidents of all the others less identified with the R.I.B.A. should be nominated in rotation.

C. On special grounds any of these other societies should be enabled to render their representative entitled to more frequent nomination than that of his normal rotation.

The adoption of such a scheme will, it is believed, tend to strengthen the societies themselves, to create among the smaller of them a spirit of emulation, and to lead all to closer identity in aims and membership with the Royal Institute.

The committee are of opinion that to give effect to the principles enumerated no alteration need be made in the by-laws, but that the end can be attained by the adoption which they recommend to the Council of the following:—

## STANDING ORDER OF COUNCIL.

1. That for the Class C (By-law No. 25) of Presidents of Allied Societies in the United Kingdom, the Council shall annually make the following nominations:—

As to one place.—The President for the time being of the Royal Institute of the Architects of Ireland.

As to six places.—The Presidents for the time being of those six of the Allied Societies which then contain the greatest number of subscribing members of the Royal Institute of British Architects.

As to two places.—In rotation the Presidents of two of the remaining Allied Societies, priority in order of rotation being given to those Societies which at the institution of the rota contain the greatest number of subscribing members of the Royal Institute of British Architects.

2. When all the said remaining Societies have been represented in such rotation, the Council may, if they think fit, then make a new order of rotation based on the same priority, and so on in cycles.

3. Should it at any time appear to the Council desirable that the President of any Society not on the rota for the year should be included in the nomination list of the Council, either on the ground of (a) the eminence of any such President, or (b) the activity in the advancement of architecture of any such society, or (c) other causes which in the opinion of the Council shall be sufficient, then the Council shall include the name of such President in the Class A of "eighteen members of Council," and shall not in such class nominate any other Fellow of the Royal Institute of British Architects resident, or practising, within the district or sphere of influence recognised by the Council as appertaining to such society.

The Committee have, of course, confined their attention to the representation of allied societies. They have not considered that of future branches of the Royal Institute of British Architects, as it would be premature to do so, and that subject will of necessity come up when the scheme for the branches *per se* is considered.

The Council are of opinion that, under present circumstances, and for a time at least, this mode of procedure will be acceptable to the allied societies, and beneficial to the Institute.

The York Architectural Society and the Cardiff, South Wales, and Monmouthshire Architects' Society were admitted to alliance with the Royal Institute at the first general meeting of the current session held November 6, 1893. . . .

The Council, having received communications from more than one quarter respecting the non-acceptance by promoters of competitions of the

award made by duly appointed and qualified assessors, have supported the general principle that such awards should be strictly adhered to.

The Royal Commission to consider and report upon the subject of a Teaching University for London have, in response to the memorial addressed to them by the Council, assigned "definite and distinct place to architecture" in the proposed University. A representative of the Royal Institute is to form one of the sixty-five members of its supreme governing body, the Senate, which, in addition to its legislative functions, is to have power to confer degrees, appoint professors and readers, and to decide such questions as the admission of "New Schools of the University." The members of the Council which attended before the Royal Commission and gave evidence were the President, the Hon. Secretary Mr. Arthur Cates, and Mr. John Slater.

The attention of the Council having been invited to the present condition of the historic monuments found in every part of the Indian Empire, a memorial on the subject was forwarded to the India Office, a reply to which was received on April 25, and therefore too late to insert in this Report. The Council wrote as follows:—

To the Right Honourable the Earl of Kimberley, K.G., Her Majesty's Secretary of State for India in Council.

MY LORD.—The Council of the Royal Institute of British Architects have the honour to invite your Lordship's consideration of the following memorandum:—

The attention of the Royal Institute has for some time been directed to the very important work initiated and carried on by the Government during the last twenty years in the matter of the systematic classification and preservation of the ancient monuments of India. The Council—fully aware of the difficulties of carrying out such a work in a country like India—desire to express, on behalf of the architectural profession, their sense of gratitude and obligation for the valuable and efficient work done and their appreciation of its unrivalled importance from an artistic, antiquarian, and historic point of view.

While sensible, however, of the value of the work already accomplished, and the labour and expense necessarily entailed, they nevertheless beg respectfully to draw attention to the following defects:—

(i.) That the classified lists of ancient monuments of Bengal and Madras and the Punjab have revision, and that systematic and exhaustive lists have yet to be made of the monuments of Mysore, Hyderabad, and Rajputana, and of the Central Provinces and Berar.

(ii.) That while there are certain archaeological officers in various parts of India, they would appear to be hardly numerous enough to exercise an efficient supervision over works necessary for the preservation or reparation of outlying monuments, the importance of which, from an historic and antiquarian standpoint, renders such supervision imperative, and natives themselves either doing more than necessary or inventing too much.

The Council of the Royal Institute beg permission, therefore, to offer the following suggestions:—

A. It would be very advantageous if no restoration works at all were permitted to be undertaken, estimates sanctioned, without the approval of the Archaeological Survey officers having been previously reported.

B. That a greater number of skilled independent archaeologists might advantageously be employed to advise how far restoration should go, and superintend the same, the work being carried out by natives, whose guilds have usually very correct traditional knowledge. Such European supervision is advisable to prevent the limits of proper conservation being exceeded.

C. That if the Government could see their way making further yearly grants for the purposes of completing the classification of the monuments of the whole of India, and of undertaking such repairs and restorations as are absolutely necessary in order to prevent the disappearance and damage by neglect of important relics, they would earn the gratitude of all lovers of art, archaeology, and history.

The immense importance of this subject, and the unequalled interest of the architecture and history of this portion of the British Empire, is the sole excuse of the Council of the Royal Institute of British Architects for feeling it necessary to put forward for your lordship with this memorial.

At the request of the Local Government Board that the Council would send a representative representative to attend a conference of delegates from other bodies respecting the constitution of a joint board for the purposes of holding examinations of sanitary inspectors and the granting of certificates of competency under the Public Health (London) Act, 1891, they appointed Mr. Thomas W. Cutler, who attended on February 20, when it was decided to refer the whole matter to a committee. Mr. Cutler is therefore acting on the committee as the representative of the Council.



The Tribunal of Appeal appointed under the London Council General Powers Act, 1890, has continued the important work entrusted to it, and is representative of the Royal Institute. Mr. Arthur Cates, has been again elected its chairman. During the year 1893-94 eleven appeals, most of them argued before the Tribunal by eminent counsel, have been heard and decided, with the result that the certificate of the Superintending Architect has been confirmed in eight and varied in three cases.

A Private Bill, promoted by the London County Council, for the purpose of consolidating and amending the enactments which relate to buildings in London—known as the London Streets and Buildings Bill—having been examined and reported on by the Practice Standing Committee, it was thought desirable that the Institute should at once secure a *vis standi* to be heard on the principles and details of the measure before any Parliamentary Committee that might be appointed for the purpose. The Council, therefore, having been authorised by the Institute in general meeting on February 12, 1894, to petition the House of Commons against the Bill, prepared the necessary document, which was duly lodged by Messrs. Loch & Co., Parliamentary Agents. Meanwhile, at the invitation of the London County Council, the Council of the Institute appointed Mr. Arthur Cates, Mr. Edwin T. Hall, and Mr. Rickman to confer with a committee of that body on certain details of the Bill which the Council could not improve; and it is satisfactory to know that a considerable number of the amendments submitted at that Conference have been accepted. In the reply made to the invitation to attend it, the Council reserved to themselves entire liberty to take any action they might be advised to take respecting points in the Bill on which that Conference might not arrive at an agreement. The importance of the subject was recognised by the Institute in the holding of a General Meeting on March 12, when Mr. Cates reviewed the London Streets and Buildings Bill in an able paper, to which Dr. Longstaff and other members of the London County Council replied at some length, and the discussion of which was resumed on March 19 at an adjourned general meeting. Another Conference on the provisions of the Bill was recently held at the Paddington Vestry Hall between representatives of the Metropolitan Vestries and District Boards, and also of the Royal Institute of British Architects, the Surveyors' Institution, the District Surveyors' Association, the Institute of Builders, and other bodies; and at this Conference Mr. Cates and Mr. Rickman, at the request of the Council and in response to an invitation, attended as delegates.

The Art Standing Committee report that nine meetings have been held since the publication of the last Annual Report, and eight since the election of the present committee. The committee record their regret at the loss sustained during the session by the decease of Mr. R. Herbert Carpenter, F.S.A., Vice-Chairman, and of Mr. C. B. Birch, A.R.A. Both gentlemen were assiduous in their attendance, and took an active interest in the work of the committee.

A report upon the recent restoration of St. John's Gate, Clerkenwell, was furnished by the committee to the Council, and forwarded by them to Sir Edmund Lechmere, Bart., M.P.

The committee conferred with Mr. Edwin T. Hall upon his proposals for the granting of medals or other rewards of merit to craftsmen, and for an Annual Exhibition of the Crafts of Architecture in connexion therewith, with a view to stimulating craftsmanship and extending the scope and influence of the Institute. The Committee, however, were not agreed as to the advantages likely to accrue therefrom, and reported to the Council in that sense. . . .

The committee appointed Mr. Alfred Waterhouse, R.A., their chairman, and Mr. Ernest George vice-chairman; and Mr. W. D. Caroe, M.A., and Mr. E. W. Mountford were appointed hon. secretaries.

The Literature Standing Committee report that since their election on June 5, 1893, they have held ten meetings, making eleven meetings altogether since the issue of the last report. . . .

In accordance with a suggestion made by Mr. Arthur Cates in a letter to the Committee, it has been decided that all new books and other contributions to the Library should in future be laid on the table, accompanied by a list of additions, for the space of one month after their acquisition; also that the notices of additions to the Library should be made a prominent feature of the "Journal."

The Prize Essays and Reports of the Travelling Students were brought before the Committee and examined, the Committee expressing the hope that pure literary merit would in future be allowed more weight in the awarding of the Essay Prize. The Librarian's Report to the Committee is as follows:—

During the twelvemonths elapsed from April 1, 1893, to March 31 of the present year, the total additions to the library amounted to 132 volumes and 63 pamphlets, and to the loan collection 18 volumes and 1 pamphlet, exclusive of periodicals, reports, and transactions of societies, and parts of works issued in a serial form now in progress.

The number of volumes presented to the library was 97, and to the loan collection 9. Of pamphlets, 62 were presented to the library and 1 to the loan collection.

Of drawings, engravings, and photographs, 143 sheets and 1 volume were presented, exclusive of the "Sketch Book" of the Architectural Association. There were also presented a medal struck for the Arthur Cates Prize for architecture, an impression of the Seal of the Manchester Society of Architects, and a bust of the late Sir Horace Jones.

The works purchased comprise 35 volumes and 1 pamphlet for the Library, and 9 volumes for the loan collection, together with several Parliamentary papers. The attendances of readers in the Library numbered 2,411. The number of tickets (exclusive of renewals) issued for admission to the use of the Library and Loan Collection was 93 (last year 98). The number of volumes issued on loan was 976 (last year 917).

The attendances of members of the Architectural Association as readers in the Library were 79 (last year 79), and the number of issues on loan (both these items being included in the gross returns above given) was 47 (last year 61).

The power conferred by the Council (as reported to the Committee at their first meeting) to eliminate from the Library such books as the Committee should think it undesirable to retain has, after due consideration in each instance, been exercised, and much extra space has thereby been gained for additions to the Library.

A gratifying feature of the past year is the number of interesting and valuable books which have been presented to the library by their respective publishers, and the thanks of the Institute are especially due to Mr. Batsford, Messrs. Chapman & Hall, Messrs. Crosby Lockwood & Son, Mr. Henry Frowde, Messrs. Kegan Paul, Trench, Trübner, & Co., Mr. John Murray, Mr. W. Reeves, Messrs. Remington & Co., Messrs. Rivington, Percival, & Co., Messrs. Swan Sonnenschein & Co., Messrs. Whittaker & Co., Mr. J. E. Cornish (Manchester), and several others.

It is similarly gratifying to report the acquisition of the great work, "Documents classés de l'Art dans les Pays-Bas," by M. Van Ysendyck [Hon. Corr. M.], a large-paper copy of which has been presented by the author; also of three folios of sketches and scraps collected by the late Sir Charles Barry, R.A., with sixteen books of diaries kept by his friend the late J. L. Wolfe, all of which have been presented by Mr. Wolfe [Err.]; and, further, of a fine collection of photographs of many public and private buildings at Sydney, presented by Sir Julian Salomons, Chief Justice of New South Wales, through Sir Arthur Blomfield, A.R.A.

The committee elected as officers for the year Professor Aitchison, A.R.A., as chairman; Mr. Alexander Graham, F.S.A., vice-chairman; and Mr. R. Elsey Smith and Mr. A. S. Flower, F.S.A., hon. secretaries.

The Practice Standing Committee have held nine meetings since their last report, and in addition to a variety of matters referred from the Council have also had under consideration several important subjects.

A sub-committee, consisting of Messrs. Boyes, Clarkson, Hall, Hansom, Rickman, and Ridge, was re-appointed in October, 1893, to further consider the consolidation and amendment of the Metropolitan Building Acts. In November attention was drawn to the resolutions embodied in the report of the Building Act Committee of the London County Council to that body, and the Practice Standing Committee reported on them to the Council. In December a copy was obtained of the London Streets and Buildings Bill, and much attention has been given to obtaining suggestions for its amendment. These suggestions have been placed in the hands of the delegates who were appointed by the Council to meet a Committee of the London Council in conference thereon. They have also been placed in the hands of those who prepared the petition of the Institute which has been lodged against the Bill now before the House of Commons.

The Committee have continued their efforts to arrange a set of conditions of contract with the Institute of Builders. On February 22, 1894, a third conference was held with the builders at which the solicitors on each side were present, and an arrangement was come to by which it is hoped that an approved draft may be obtained and reported to the Council. The draft, however, is still under discussion by the solicitors. The Committee appointed Mr. Henry Currey their Chairman, Mr. Arthur Cates Vice-Chairman, and Mr. Rickman, F.S.A., and Mr. H. Cowell Boyes Hon. Secretaries.

The Science Standing Committee during the official year have held eight meetings, with an average attendance of twelve members. In accordance with the request of the general meeting, held on March 13, 1893, the committee reconsidered and revised their report upon the existing laws in relation to light and air, and presented it to the Council in January last, recommending that it be brought before the members at the General meeting of the Institute for consideration. A copy of the report was forwarded on March 27 to the London County Council. The Sanitary Registration Bill, 1893, was considered by the committee, and formed the subject of a report, which was printed in the *Journal*, November 23, 1893 [p. 63]. . . .

In order that accurate information may be obtained as to the strength of brickwork a series of experimental tests has been proposed, and a Report by a Sub-committee descriptive of what is considered necessary was printed in the *Journal* of November 23, 1893 [p. 55]. In relation thereto the Committee suggested the establishment of a fund for experimental research in connexion with building construction, the first application of such fund to be towards the expenses to be incurred in prosecuting the tests described. The recent treatment of sewage with electrolysed sea-water has attracted the attention of the Committee, and a Sub-committee has been appointed to inquire into and report upon the process invented by M. Hermitte. The Committee appointed Mr. P. Gordon Smith their Chairman, and Mr. Thomas W. Cutler, Vice-Chairman; and Mr. H. D. Seales-Wood and Mr. William C. Street Hon. Secretaries.

A sum of about 2,600*l.* had been expended during the four years 1890-93 on the purchase of Architectural Union Company's shares, in building additions, fittings, furniture, &c., over and above the amount acquired from the sale of 1,000*l.* Consols authorised by the Institute in 1890. Of that sum of 2,600*l.* about 1,000*l.* had been paid from entrance fees and ordinary income, and the balance remained unprovided for. The Institute consequently authorised, at the last Annual General Meeting, the sale of 1,310 2*s.* 9*d.* Consols, which was effected in December, 1893, and realised 1,281*l.* 8*s.* 6*d.*, thereby leaving a balance of exceptional expenditure of about 320*l.* unprovided for to be paid out of the entrance fees received in 1894.

The Income and Expenditure Account and the balance-sheet for the year ending December 31, 1893, were appended to the report.

#### INCORPORATED ASSOCIATION OF MUNICIPAL AND COUNTY ENGINEERS.

A YORKSHIRE district meeting of the members of this Association was held at Keighley on the 5th inst. Mr. J. T. Eays, of West Bromwich, President of the Association, presided, and there was a large attendance of members, principally from Yorkshire, Lancashire, and the North of England.

The members of the Association were received in the Council Chamber at the Municipal Buildings, Keighley, by the Deputy Mayor and other members of the Corporation.

The Deputy Mayor, in offering the members of the Association a hearty welcome, mentioned that Keighley had on hand a number of important engineering schemes, all of which had been designed and were being carried out by Mr. Hopkinson, the Borough Engineer.

On the motion of Mr. Hopkinson, seconded by Mr. Spinks, of Leeds, Mr. T. W. Stainthorpe, of Eston, Grangetown, was re-elected honorary district secretary for the Yorkshire district.

Mr. W. H. Hopkinson, Borough Engineer, then read a paper on the Water and Sewage Works of Keighley. He said the borough of Keighley, which was incorporated in 1882, had a population at the last census of 30,811, and a rateable value on July 1 last of 96,254*l.* The staple industry is worsted, but a very considerable business is done in ironwork of all descriptions. In the year 1816 a private company was formed



for the purpose of supplying water. In 1865, when the company was only able to supply the inhabitants with about six gallons of water per day per head of population, the then Local Board of Health resolved to purchase the undertaking, for which they paid the sum of 17,000*l*. After purchasing the undertaking the Local Board commenced looking for fresh water supplies, and in 1869 applied to Parliament for and received sanction to a scheme to construct necessary reservoirs. The scheme comprised the construction of a high-level storage reservoir called "Watershedles," on the Pennine range, at the head of the River Worth; a millowners' compensation reservoir called "Ponden," some two miles lower down the stream; the construction of a low-level storage reservoir called "Bully Trees" in the township of Howarth on the Sladen stream, which is a tributary of the River Worth; with a millowners' compensation reservoir called "Lower Laithe" at the foot of the bank of the last-mentioned reservoir; and the making of catch-water conduits, and laying of mains for the storage reservoir to the service filter reservoir called "Black Hill" in the town. On the sanction being granted the Local Board constructed Watershedles storage, Ponden compensation, Black Hill service, with necessary conduits and mains. The top water level of Watershedles reservoir is 1,100 ft. above ordnance; the same is constructed by throwing an earth bank across the valley, with a puddle wall in the centre of such bank; the inside of the bank is pitched with dry rubble. The depth of water is 51 ft. 3 in., and the capacity about 156,000,000 gals. The water is brought to the reservoir by means of open and covered catch-water conduits. The gathering-ground, which is 1,600 acres in extent, is principally moorland overlying millstone grit. The water is brought to Black Hill service reservoir, which is 1,800 ft. above ordnance, by means of an iron pipe main, varying from 18 in. to 12 in. in diameter. "Black Hill" reservoir, which up to this year has been used as a service and filter, has a capacity of 2,500,000 gals. "Ponden" reservoir (which is the millowners' compensation) had to be constructed before the Local Board could take and utilise the water from "Watershedles"; its depth is 49 ft., it has a capacity of about 212,500,000 gals., is of similar construction as "Watershedles," and has a gathering-ground of 900 acres. The two reservoirs on the Sladen stream have not been constructed, as the Corporation in 1891 got an extension of ten years wherein to construct. The total storage of water in all the reservoirs for the town's use is about 170,000,000 gals. The water is considered very pure, but soft, being about 1½ degs. of hardness. On account of the water containing an acid which acts upon lead service pipes, the Corporation in 1884 laid down at "Black Hill" reservoir an open conduit, and placed therein a quantity of Derbyshire limestone through which the water had to pass, and coming in contact with the limestone the water was hardened, but not sufficiently to stop the action on the lead pipes. The Corporation then, under advice, placed daily in the conduit about 100 lbs. of fresh fallen lime, and raised the water to two degrees of hardness, which had the effect of stopping the action upon lead pipes. In 1892 the filter of "Black Hill" showed signs of not passing the water freely, and the Corporation decided to push on with the new filter-beds at Oldfield, for which Parliamentary sanction was obtained in 1891. The author has designed these works, and is carrying out the same by day work. The works, which were commenced in May last, comprise three small "Polarite" beds, four sand-filters, one clean water reservoir, and manager's house. The "Polarite" beds are so constructed that the water must pass downward through the "Polarite" and rise again to near the level of inlet; the object of the "Polarite" is to destroy the organic matter. From these beds the water passes on to and through the sand-filters at a rate of 500 gallons per yard per 24 hours into the clean water reservoir, from which it is delivered to the consumers. It is intended to work three sand-filters, and to be cleaning one: the three filters will pass about 2,016,000 gallons per day of 24 hours. The "Polarite" chambers have concrete bottoms 12 in. in thickness, with concrete walls, puddle backing, and faced with salt-glazed bricks; each chamber for "Polarite" is 30 ft. by 12 ft. 3 in., with 2 ft. 6 in. or 30 tons of "Polarite" per chamber. The sand-filters are 110 ft. square, with concrete bottom, and concrete side walls 4 ft. high; above the concrete wall is ashlar blocking walling, backed with concrete and finished with 20 in. by

8 in. boasted coping. Of the two filters completed, the filtering media of one is as follows, viz.:—18 in. of hand-packed rubble sandstone, 6 in. of 4-in. broken sandstone, 3 in. of 1½-in. broken stone, 3 in. of ¾-in. to 1-in. gravel, and 18 in. of sand, or a total depth of 4 ft. Rubble drains are formed in the bottom to carry water to the manhole, where the water rises and passes over the weir and into the clean water reservoir. The other filter-bed has 18 in. of limestone in the bottom instead of sandstone rubble; this has been put in as an experiment to harden the water. The effect of this will be noticed by the analyst's report given. The sand for the filters was crushed by one of "Carter's" Disintegrators, and the author thinks he was the first to use one of these machines for such a purpose, and considers the same has done its work well. The cost of crushing the sand is 5½d. per cubic yard of sand crushed; this includes men's time and renewal of beaters only. The washing of the dirty sand is done by Walker's patent conical washing machines. The cost of washing is 2s. per cubic yard, which includes scraping-bed, wheeling to washer, washing, wheeling back on to bed and laying, but does not include any cost for water. The clean water reservoir is 110 ft. square and 16 ft. deep, and holds 1,660,000 gallons; the walls are of concrete, with concrete buttresses, finished with ashlar walls and coping similar to the filter-beds. The whole of the concrete is made of 3 of sand and stone to 1 of cement. The estimated cost of the filter-beds is 12,550*l*. The cost of the waterworks amounts altogether to 185,961*l*.—made up as follows—old works 17,000*l*., Watershedles 49,423*l*., Ponden 75,502*l*., Black Hill 6,320*l*., Main 14,586*l*., Parliamentary, legal, and engineering expenses 10,580*l*., and new filter-works 12,550*l*. The following is the analysis of the water—viz., No. 1 is the water from Watershedles reservoir; No. 2 is No. 1 after passing polarite; No. 3 is No. 2 after passing sand-filter with limestone; No. 4 is No. 2 after passing filter of all sand.

	No. 1.	No. 2.	No. 3.	No. 4.
Appearance in a ft. tube .....	Turbid and brown	Slightly turbid	Clear and bright	Slightly turbid
Small when heated to 100° F. ....	None	None	None	None
Chlorine in chlorides .....	None	None	None	None
Phosphoric acid in phosphates .....	None	None	None	None
Ammonia, free .....	None	None	None	None
Hardness, after boiling .....	100/6	100/4	100/3	100/3
Lead .....	1/4	1/4	1/4	1/4
Reaction .....	None	None	None	None
Total solid matter dried at 212° .....	1/6	1/6	1/6	1/6
Sediment on standing some time .....	Small amount	Small amount	None	None
Microscopical examination of sediment .....	Vegetable debris	Vegetable debris	None	None

The sewage farm, which is situated at Marley, in the Bingley township, is laid out on the intermittent downward filtration principle. No sewage, as yet, has been brought on to the farm. The area laid out is thirty-six acres, of which thirty-two acres are in beds. The sewage will not be treated in any way beyond screening. The carriers are 3 ft. by 2 ft., formed of concrete 6 in. thick, made of 3 of broken stone, 2 of river sand, to 1 of cement; the carrier has a fall of 1 in 1,400. Sluice doors are fixed at intervals to divert the sewage on to the beds by means of pipes and steps. The nature of the ground varies, a large portion being loamy soil 6 ft. deep, another portion is gravel, and another portion clay and sandy clay overlying gravel. The farm is laid out to deal with the sewage of 1,000 persons per acre, but if this is found to be insufficient the Corporation have a large reserve of land for further extensions. The effluent drain varies in size from 24-in. brick sewer to a

12-in. pipe sewer. The cost of the farm is as follows, viz.:—land per acre, 125*l*., effluent drain, which is made sufficiently large for future extension of farm, 1,944*l*., river bank and piling, 2,186*l*.; beds, underdrains, carriers, and sewer, 6,005*l*. The estimated cost of the sewage farm and sewerage scheme is 31,000*l*.

Mr. Escott (Halifax) proposed a vote of thanks to Mr. Hopkinson for his paper, and congratulated him upon the extensive works he was carrying out at Keighley.

Mr. Cox (Bradford) seconded the vote of thanks, which was accorded, and a short discussion followed.

Mr. Walker (Reading) suggested the use of coke or some other straining material to remove suspended matter before the water reached the polarite beds.

Mr. Candy (London) thought the method adopted for hardening the water by limestone an excellent one, which would effect an enormous saving. He was at a town recently where there were spending 1,000*l*. a year for soda for hardening purposes.

The members were entertained to luncheon at the Municipal Buildings by the Mayor (Mr. Paget), and in the afternoon visited Oakworth House, the residence of Sir Isaac Holden, M.P., who had consented to allow the members to visit his grounds and winter gardens, and the filter-beds at Oldfield, where the process of filtration was inspected.

#### MAGAZINES AND REVIEWS.\*

The *Art Journal* gives as frontispiece an engraving of what we have always considered to be one of the most perfect of Sir F. Leighton's works, "Weaving the Wreath," but unfortunately the reproduction suggests none of the colour values of the original, the figure coming out as a dark mass. "London by Canaletto," by the Royal Librarian, Mr. Holmes, gives some interesting illustrations, mainly of old Westminster Bridge—a structure too narrow in its arch certainly, but in every other respect how superior to the present bridge. In "The Pianoforte, Past, Present, and Future," Mr. Runciman makes rather uncalculated attack upon the general form of the grand pianoforte, which, in fact, is the natural outcome of the practical construction of the instrument; what it wants is improvement in detail, not in general form. Cheetham Hospital, Manchester, is the subject of an illustrated article by Mr. Walter T. Browne.

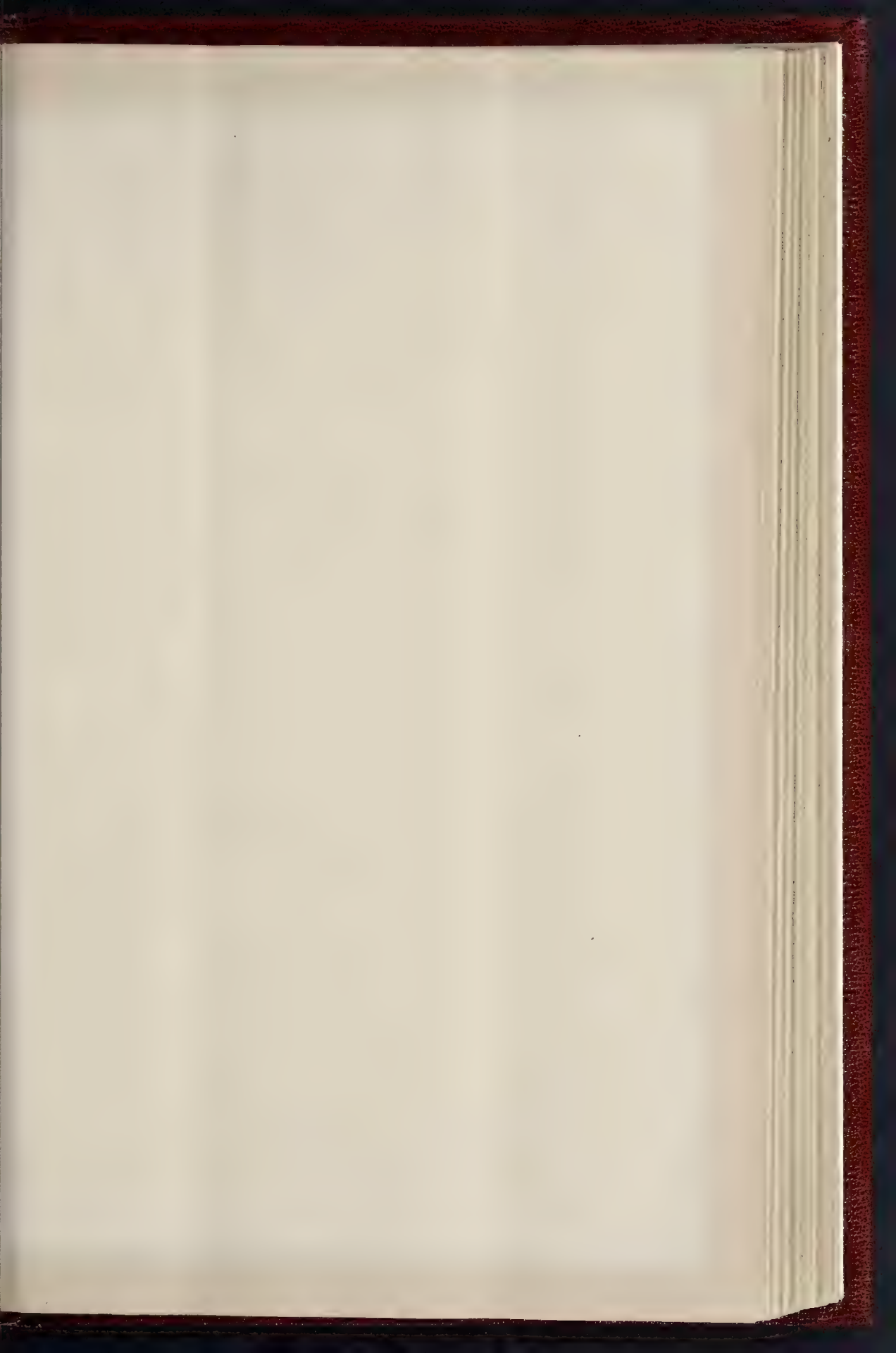
In the *Magazine of Art* Mr. Austin Dobson concludes his article on Roubillard, and Mr. Loft writes on Emmanuel Hospital, with illustration by Mr. Herbert Railton. Mr. Spielmann commences a series of articles on the Royal Academy of 1894, illustrated by reproductions of Sir F. Leighton's studies for "Faticida" and "The Spirit of the Summit," which are perhaps more interesting than their ultimate results. "Authentic Portraits of Burns," by Mr. J. M. Gray, deals with an interesting subject, illustrated by reproductions of various portraits. The frontispiece is a photograph from Albert Moore's "The Fan."

The *Studio* contains an illustrated article on Albert Moore by Mr. A. L. Baldry. "Some Remarks on Artistic Lithography" is an interesting and practical article on methods of lithographic drawing, by Mr. W. Rothenstein. Mr. R. A. Briggs contributes an illustrated article of "Bungalows," a more purely architectural contribution than generally finds place in this magazine, accompanied even by plans! Among the separate illustrations is a reproduction of Sir F. Leighton's celebrated "Study of a Lemon Tree."

In the *Architectural Review* (Boston) Vol. 1 No. 5, will be found an interesting "Study of Origins in Byzantine Structural Art" by Mr. A. D. F. Hamlin. No. 6 contains the first instalment of an article under the title "A Glimpse of Modern Greece" by Mr. T. A. Fox. Among the illustrations in the two numbers (which have reached us simultaneously) the most interesting of those of the details of the Bowdoin Square Theatre at Boston, of which Mr. C. H. Blackall is the architect.

The *Architectural Record* for the current quarter contains a most useful tabular summary of the chronology of French cathedrals, their commencement and the various changes made in them, which is alone worth procuring the number.

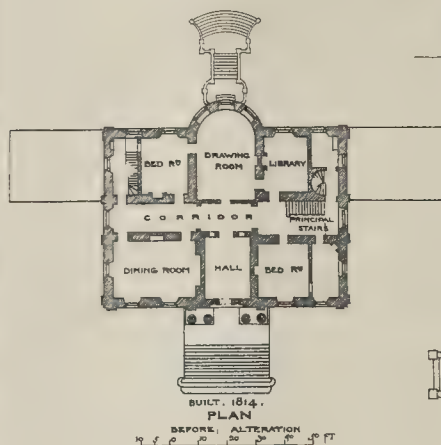
\* The object of these notes is to point out anything of interest in the contents of the current magazines, which is of special interest to our readers, with occasional brief criticisms of the views expressed in such articles. Where a magazine which has been sent to us is not noticed, it is because the number contains nothing that it is within our province to comment upon.





JARDINE HALL DUMFRIES  
D. J. JARDINE ESQ<sup>RE</sup>

ALTERATIONS AND ADDITIONS



PLAN OF FIRST OR

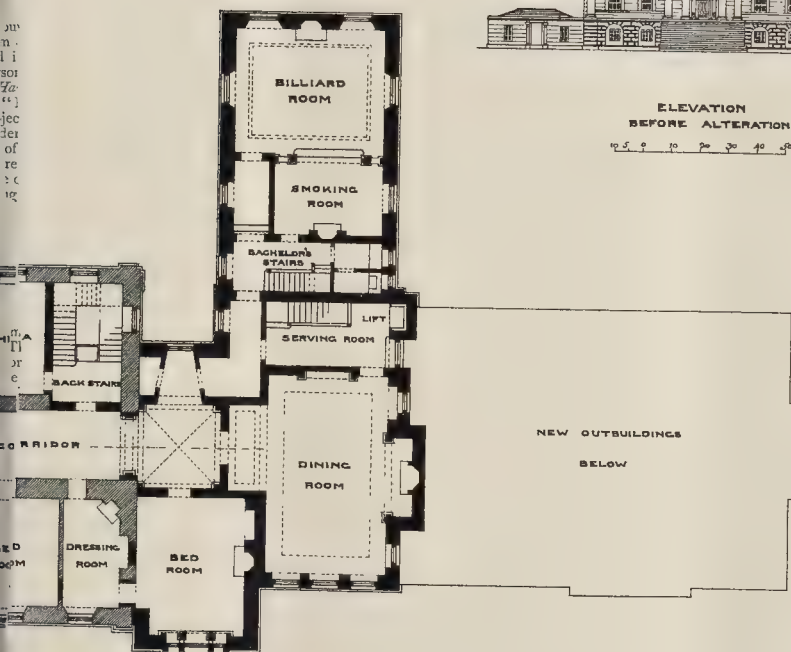
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ENTRANCE

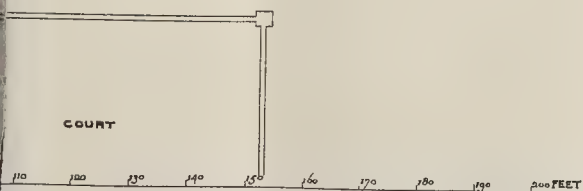


ELEVATION  
BEFORE ALTERATION

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PRINCIPAL FLOOR



E. J. MAY ARCHITECT





Mr. E. Flagg concludes his article on the Ecole des Beaux-Arts. The *Record* has, as usual, a great number and variety of good though all illustrations.

In the *Nineteenth Century* Sir Benjamin Baker writes the article of one holding a brief for the Philæ reservoir, making light of all the sentimental objections to it, and of the fact that his client Sir Benjamin Baker is right in considering that his views will recommend themselves to the "common sense of the majority English people" we may very well believe; know perfectly what that stands for. It is hoped that some competent writer will have an opportunity of stating the other side of the question in the following number. Mrs. Costelloe's article on "The New Old Art Criticism" is a plea in favour of more accurate archaeological knowledge about pictures taking the place of æsthetic criticism; of value, in fact, of "sound connoisseurship" as basis of art criticism. Perhaps such a protest not uncalled for.

In *Scribner* Mr. Hamerton writes a short article of the French painter, Meunier, in connexion with a frontispiece from one of his works. "Some episodes of Mountaineering," by Mr. E. L. Bells, is an interesting and well-illustrated article. To the *Century* Mr. W. A. Coffin contributes an excellent article on that remarkable artist, Dagnan-Bouveret, with a series of very good illustrations from his works. "Contrasts of English and American Scenery" is a subject of the artistic interest, the impressions (in words, not sketches) of an American after visiting England. "Bookbindings of the Past," by Mr. Under Matthews, is an article containing a good deal of information, supplemented by illustrations of a number of charming examples of ancient bookbindings. "Across Asia on a Bicycle," an account of the journey of two American students in Constantinople to Peking, is worth reading, and is illustrated by sketches of native types of houses and buildings.

*Harper* contains an article by Mr. T. Hastings "Life in Relation to Architectural Style," a subject calculated to attract the architectural reader, who, however, will find nothing in it but often-repeated lesson that we should get rid of reproduction of past styles and build in the style of our own century, &c.; all which is true enough but has been repeated over and over again, may possibly be more new to American than to English readers.

In the *Fortnightly Review* Mr. D. A. Thomas, P. (whom we take to be a Welsh colliery man), writes a short practical article on the new Eight Hours Bill. He mentions that he had the "eight hours from bank to bank" men, working shifts, and that after a year's trial the men asked to return to the old system. Thomas criticises the idea of a hard and fast rule for all collieries without distinction as to the nature of the soil as affecting conditions of work; Parliament cannot alter the geological conditions of coal mining and equalise the conditions of which colliery operations are carried on in the various districts. In the same magazine Mr. F. Frel, in an otherwise very interesting article on English and French Manners makes some exaggerated remarks at the close in contrast-English and French art. It is quite true that English public en masse are utterly without conception as to art, compared with the French, but English artists are not; on the contrary they are in some things superior to the French, as the best French critics fully admit. Carrel has weakened the force of his strictures by carrying them too far and applying them generally.

In the *New Review* Mr. Stead compares "the Babylons" of London and Chicago, much to advantage of the former, and Sir Herbert Wells contributes a useful and interesting article on London trees, with some illustrations, saying which trees thrive best in special situations, what can be done to maintain them, &c. The *Pall Mall Magazine* has an illustrated article on "The Transformation of Thirlmere" some account of the changes made in the lake and surroundings of Thirlmere in the process of repairing it to form a water reservoir.

*Malania* contains an article by Mr. Kineton on "Silk-weaving" with some illustrations of woven designs. *Lackwood* publishes a weighty and well-edited article by Mr. Warneford Moffat on the Aim Behind the Eight Hours Bill, which is intended to the attention of those who have caught by its illusory promises. They will find some plain truths plainly put.

In the *Gentleman's Magazine* Mr. F. M. Holmes writes a very "popular" article on "the Genesis of the Steamboat," a short summary of the history of steam navigation.

*Belgravia* contains an article which, under the title of "Music in the Making," professes to give an account of the technical process of putting together a piano, which, however, reads practically like an advertisement of a certain pianoforte-making firm which lets slip no opportunity of proclaiming itself.

In the *Cornhill* an article on "The Carnarvon Peninsula" gives some account of the people, and the "local colour" generally, of a corner of the realm which is not very much known, and which seems to retain a great deal of that individuality of character which is often to be found in the parts of the country that are off the highway of travel.

In the *Antiquary* we have the continuation of "Roads and Boundaries," by Mr. Boyle, and of "Armour in the Tower," by Viscount Dillon. This latter article would be much the more interesting for a few illustrative sketches.

The eighth number of *Punch Pictures* revives some of Doyle's inimitable studies of character in the history of "Brown, Jones, and Robinson." We hope the sequel of this set will be given. They are quite different from anything with which the modern readers of *Punch* are familiar; we do not say necessarily better, but they are unique of their kind, and remarkable examples of the amount of humour and character which Doyle could impart into small sketches with little elaboration of shading or finish.

#### ARCHITECTURAL ASSOCIATION SPRING VISITS:

CHURCH FOR CATHOLIC APOSTOLIC COMMUNITY, MAIDA HILL.

On Saturday last a special visit, arranged by Mr. Banister F. Fletcher, Jun., Hon. Sec., was paid by kind permission of Mr. J. L. Pearson, R.A., to the new church for the Catholic Apostolic community, which is being erected on the banks of the Regent's Canal, in Maida Hill, West. In the absence of Mr. Pearson, Mr. W. D. Caröe, M.A., attended on his behalf, and conducted the members over the building, which is approaching completion. Mr. Caröe commenced by giving a short sketch of the religious tenets of the community, showing the effect these have had on the ground-plan of the church, following up with some interesting remarks on vaulting, which were much appreciated by the members.

The church consists of a nave 24 ft. wide between the piers (or 4 ft. less than Mr. Pearson's well-known church of St. Augustine's at Kilburn), with north and south aisles 12 ft. wide, separated from the nave by arches resting on moulded caps. The total length of the church is about 160 ft., and the height of the internal vault is 60 ft.

There are two entrances at the west end, ingeniously planned for the exclusion of draughts. The baptistry is placed in the centre of the west front, and is enclosed by a deep-set arch, the main west window being on the inner face. A gallery is also placed at the west end. The Lady Chapel is on the south of the chancel, and is 18 ft. wide, and treated somewhat similarly to Mr. Pearson's work at Truro Cathedral, the vault resting on slender shafts disengaged 15 in. from the wall, and presenting a very satisfactory distribution of light and shade. The main apse is polygonal, and a communicating passage is carried round. The vaulting of this part of the church was especially admired—as, indeed, throughout the church, the whole being most thoroughly worked out and executed.

The north choir aisles are to be used for the more secular uses in connexion with the management of the church, while on the south side of the church are placed the various vestries, reached from a main corridor running north and south. These vestries are appropriated to the use of the angels, priests, deacons, and evangelists; they are 15 ft. wide, and of varying length, the roofs internally and the doors being finished in New Zealand Kauri pine, finished with natural surface, the flooring being wood-block keyed in tar. An area is formed on the south side which provides light for the south aisle of the church and the corridor already mentioned. The foundations to the tower at the south-west have been put in, but the tower itself is not commenced. On the north side of the church is the caretaker's house in two stories, the chimney-pieces and doors being finished in Kauri pine. Connected by a passage also on this side is a conference room with an open oak roof. The organ chamber

is placed over the north choir aisles at the junction with the transept, and well opened on both sides to the church. It has a close-boarded wooden ceiling. The flooring to the main body of the church has been executed by Messrs. Pattison, of Manchester, in Venetian terrazzo mosaic in various colours, from Mr. Pearson's designs. The flooring to the chancel is in Opus Alexandrinum mosaic, every piece of which, Mr. Caröe remarked, had been drawn full size by Mr. Pearson. The stall fittings to the chancel will be of teak.

The whole of the church internally is executed in Stamford stone of the Oolite formation, and has a varying rich brown colour, and is left with a tooled face. The vaulting is in the same material. The heating is on the high-pressure system by Mr. Perkins, and separate boilers are provided for nave and vestries. The church will be lighted by electricity, the work being executed by Messrs. Spagnoletti & Crookes. The stained glass has been executed by Messrs Clayton & Bell and by Mr. Hemmings. Externally the materials used are Box Ground stone and red Acton bricks, which have been subjected to severe tests. The roofs are covered with red tiles from Maidenhead, the central flèche being covered with lead. The exterior was very much admired, views of it from several points in the neighbourhood being obtained with Mr. Caröe's assistance. The contractors are Messrs. Luscombe & Sons, of Exeter, whose foreman, Mr. Charles Shapley, placed himself at the disposal of the members. A hearty vote of thanks was passed to Mr. Caröe for his kindness in representing Mr. Pearson, and for the very interesting remarks, which he had given them about the construction of the church.

#### THE ARCHITECTURAL ASSOCIATION

##### SOIREE.

The members' *soirée* of the Architectural Association was held on the 4th inst., at the Holborn Town Hall, and, as usual, a large number of members attended. The entertainment consisted of a "play," in which members of the Association took part, but which, diverting as it undoubtedly was, contained fewer "allusions" than on previous occasions, though, as a compensation, and no small one, the piece was admirably staged and very well acted.

The play was described on the "bill" as "an operatic, melodramatic, extravaganza, a trifle, 'Architopia, Unlimited, a Lyrical Laye of Ladye Lande, by Arthur W. Earle and E. Howley Sim,' and consisted of two acts. As usual the dialogue and songs served as vehicles for some free and easy topical allusions, though in some instances these seemed to be overdrawn. For instance, Jabez says to the County Councillor, 'Well, what's the latest news, Mr. Councillor? How many more ancient City temples can we pull down that I may build rows of Architeopean villas upon their site?' 'Sir,' replies the County Councillor, 'Our energy has been so great that not one remains. They have been renewed entirely'—which is an aspersation upon the London County Council, at all events, for that body, so far as we are aware, cannot fairly be charged with vandalism, whatever else may be alleged against it. But other allusions are happier, and the song—a parody of "E Dunno Where 'E Are"—in which "Robert" and "William" (two architects of unenviable notoriety) were referred to, was cleverly written and received with a good deal of laughter. Other good songs were "Tommy Atkins," and the "Old Brigade," both well sung by Mr. S. Constanduros.

On the whole the play was a very good successor of those which preceded it, although it was got up, we are informed, at very short notice—a statement which says a good deal for the ability of the actors, but which suggests that during that short period more time was given to the music halls than to the pursuit of architecture.

The scenery was devised and executed by Mr. E. Graham Simpson, of the firm of W. D. Simpson & Sons, of St. Martin's Lane, and some of the original properties were provided by Messrs. Colls, of Coleman-street. The proscenium and stage were erected by Messrs. E. & A. Williams, of Southwark Park-road, S.E.

The stage manager was Mr. F. T. W. Miller and the director of music Mr. Clement Lockman. The design on the front of the "bill" was by Mr. Harold Bailey and was based upon Mr. Walter Crane's design for the Association monogram, which now appears on the Brown-book, the head of the President, Mr. E. W. Mountford, being worked into Mr. Bailey's design.



## Illustrations.

## ST. CUTHBERT'S, EDINBURGH.

**T**HIS illustration, the original drawing of which forms one of the most effective drawings in the Architectural Room at the Royal Academy, shows the new church of St. Cuthbert, Edinburgh, still in progress from the designs of Mr. Hippolyte Blanc, on the site of an old church of the middle of the last century, which it was found necessary to demolish.

The plan of the church, which is appended, sufficiently explains its general arrangement. It appears that the tower and spire are the old ones retained, a fact of which we were not aware when commenting on the design in our last issue, as there was nothing in the drawing, of course, to indicate the fact. The retention of the tower has naturally given the key for the style and design of the new church.

The foundation-stone was laid on May 18, 1892, the stone laid forming the foundation for the pulpit. The whole flooring has been raised about 3 ft. 6 in. above the old level, and the space has been covered with a deposit of concrete finished with asphalt. A gas-engine in the tower is to be used for pumping out the vitiated air and ensuring the thorough ventilation of the building. The cost of the building will be about 18,000*l*.

## JARDINE HALL, DUMFRIESSHIRE.

THESE additions have been going on for about two years. The existing house was built in the early part of this century, and does not possess any architectural interest, either inside or out, but the grounds round the house were laid out at the same time in a fine, large, symmetrical way, and the arrangements of the new principal rooms have been influenced by the formal surroundings. One special object in remodelling the existing house has been the removal of the awkward flight of steps at the principal entrance and the building of a lower entrance hall on the ground level and making the steps to reach the principal floor inside the house. The work is being carried out on the local system, with a separate contract with each tradesman. The stone used, both in the original building and the new parts, is the red stone from the Corncockle quarry, which is on the estate. The clerk of works is Mr. D. Ruddle, and the architect, Mr. E. J. May, of London.

## DESIGN FOR ROYAL MAUSOLEUM:

## THE PRIZE DRAWINGS.

THIS design, after the style of Palladio, covers a floor space of 1,200 sq. ft. It is octagonal on plan, inside of which is a circle of eight columns, carrying a gallery. Above this there is a dome, surmounted by a cupola.

The weight of the latter is carried directly down by eight steel girders over the centres of the columns which support the gallery, the girders being tied in at the crown and springing of the dome by circular steel ties, as shown in the section.

On four sides of the octagon are domed chapels, through the floor of one of which the coffins are lowered into the crypt, to which access is obtained by a staircase concealed behind the altar—a similar staircase on the opposite side leading up to the gallery.

The principal tomb is placed in the centre of the building, under the dome, less important ones being placed between the columns and in the chapels.

The building would be carried out in Portland stone, the interior being enriched with mural paintings where practicable, and the floor laid in marble to the design shown on plan.

A. R. HENNELL.

## "PERSEUS AND ANDROMEDA."

THIS fine work, a repetition in bronze of a plaster model exhibited last year, stands in the centre of the Octagon Hall at the Royal Academy. We commented at some length on the design when the model was exhibited last year.

The group explains itself; the moment chosen is when Perseus holds up the Gorgon head to destroy the dragon. In representing Andromeda as already prostrated by the attack of the dragon, the artist gives an interesting variation from the usual representations in art, in which Andromeda is—traditionally one might say—represented as still upright against the rock, awaiting her end. The reading adopted by the sculptor in this case has given him the opportunity for compressing all

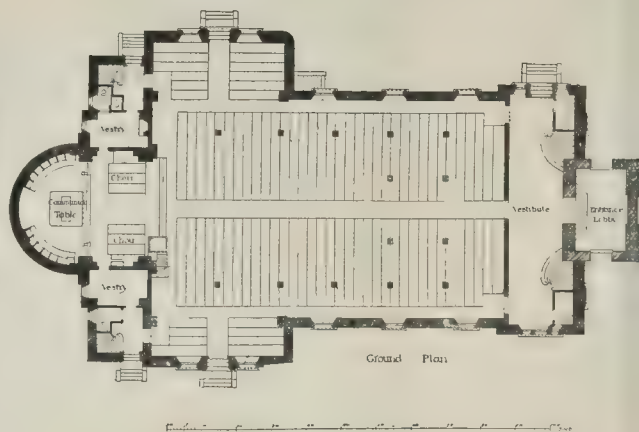
the three actors in the scene into one group, more closely than would otherwise have been possible.

Mr. H. C. Fehr is the sculptor. The work has been purchased by the Academy from the Chantry Bequest, at the price of 1,200*l*. The honour is well merited.

## PRIVATE BILL LEGISLATION.

SIR J. KENNAWAY'S Committee gave their decision on the 3rd inst. on the workmen's trains to be run over the railway proposed to be made from near Finsbury-square by way of Kingsland, Clapton, and Walthamstow, to High Beach, junctions to be constructed with the Great Eastern and Tottenham and South Hampstead Junction Railways. The proposed capital is 2,100,000*l*, with the usual one-third borrowing powers. The preamble of the Bill was passed on the 2nd inst., the only question left over being as to the running of workmen's trains. The decision of the Committee was that in Clause 59 of the Bill, instead of the words proposed to be inserted by the company of three or less than three miles, there should be inserted nine miles or less than nine miles, for a penny fare for each journey. They would fix the time for the arrival of the latest workmen's train at eight o'clock, instead of at seven o'clock as proposed by the promoters. After conversation, the committee agreed to substitute for the provision requiring at least two trains to be run each way, morning and evening, words giving the Board of Trade power to decide on the question of sufficiency in number and accommodation of the workmen's trains.—Dr. Longstaff, Chairman of the Building Acts Committee of the London County Council, gave evidence in the Select Committee on the Bill of the Council for consolidating and amending the enactments relating to streets and buildings in the metropolis, Part I. being specially before the Committee, showing how far and in what respect it differed from a mere measure of consolidation. Further consideration of the Bill was adjourned.—On the 7th inst. Dr. Longstaff was further examined, and the promoters' case for Part I. of the Bill closed. The Committee again adjourned.—The Committee had before them on the 4th inst. the Improvements Bill of the London County Council. The measure empowered the Council to acquire land for sites or enlargement of sites for the purposes of the Metropolitan Fire Brigade at Edgware-road, Battersea, and on the Thames Embankment, lands for the purposes of a Weights and Measures office in Clerkenwell, for the purposes of the establishment of corner's courts and mortuaries at Bethnal Green, Hammersmith, Paddington, and Kensington. It also authorised the alteration and reconstruction of Highgate Archway and the approaches thereto, the widening of Horsey-lane and of Archway-road, the widening of Wood-lane, Hammersmith; it proposed to extend the power for compulsory purchase and completion of works in connection with the works of the Thames Tunnel (Blackwall), Isle of Dogs Bridges, the new street from Evelyn-

## ST CUTHBERT'S PARISH CHURCH



Ground Plan

street to Creek-road (Deptford), and the wider of St. George's-place, Knightsbridge; and it proposed to empower the Council to purchase and take the garden in Lincoln's Inn-fields hold it as a public garden or open space. A Bill was passed, with some slight amendment.

## THE LONDON COUNTY COUNCIL

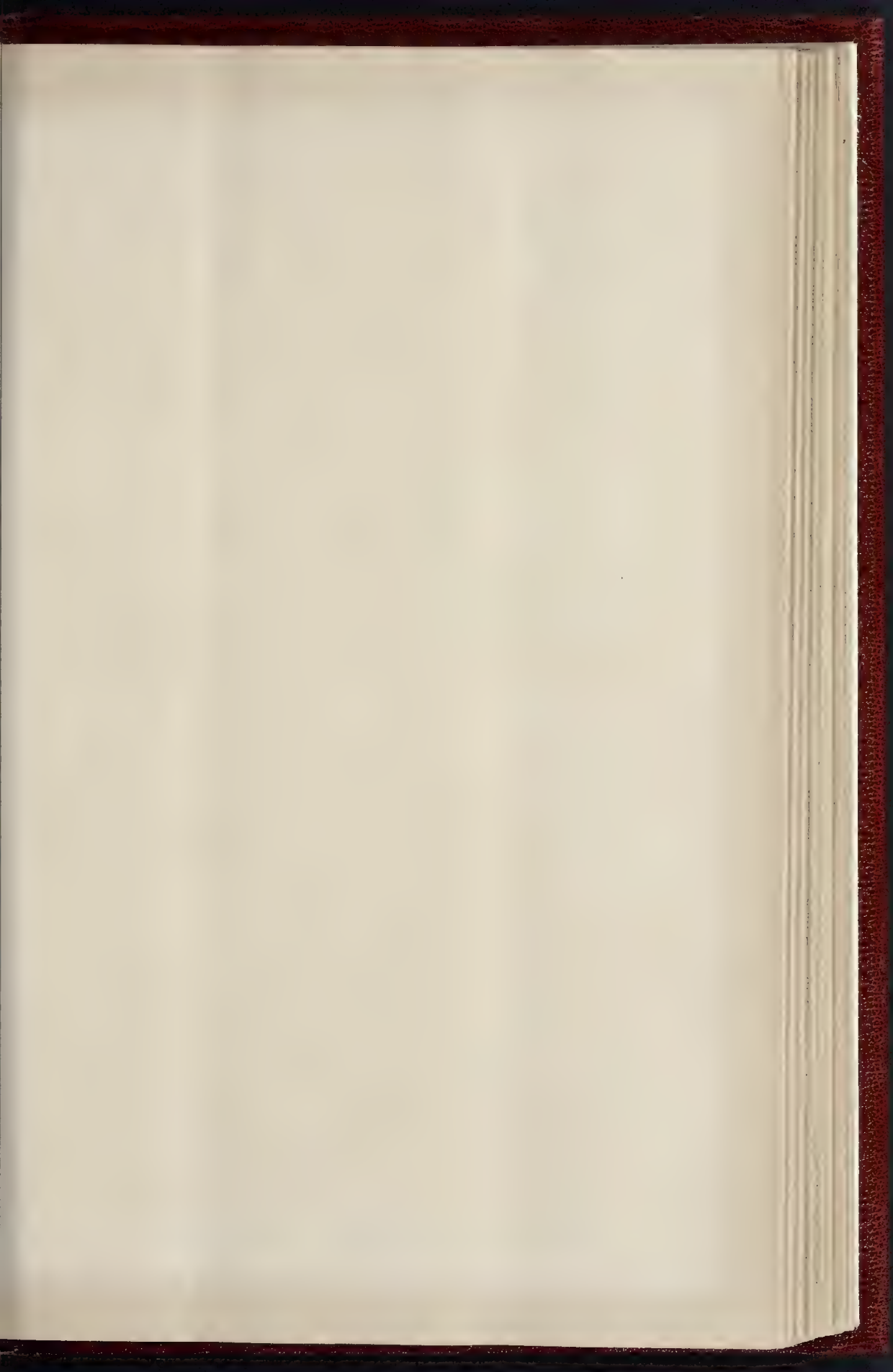
THE usual weekly meeting of the London County Council was held on Tuesday at County Hall, Spring-gardens, Mr. John Hutcheon, Chairman, presiding.

*Proposed addition to the Fire Brigade.*—The Fire Brigade Committee brought up a recommendation that 1,000*l*. should be spent ground for a fire-engine station at Streatham, a similar sum for buildings thereon; that 2,000*l*. should be expended on the sites for fire-engine stations at Perry Vale and Shepherd's Bush; land for five sub-stations should be acquired 2,000*l*., and five street stations erected at estimated cost of 750*l*.; and that a temporary station should be built at Streatham at a cost of 150*l*.. It was further proposed that there should be five additional steam fire-engines, seven fire-escapes, eleven hose-carts, four hand cart and fire-escape stations, three hose stations, seventeen fire-escape stations, and fire-alarms for Streatham. The number of proposed to be added to the Brigade was eight. Under the head of cost the "capital" items were—"ground" 5,000*l*., "buildings" 1,900*l*., and "appliances and gear" 3,800*l*., and, under the head of maintenance, "rents, rates, gas, water, telephones, &c." 650*l*., and "clothing and medical attendance" 600*l*.. The cost of the eighty additional firemen for a year would be, the Committee stated, 6,000*l*..

The consideration of the report was postponed.

*Electric Lighting installation for the Victoria Embankment, and the Westminster and Waterloo Bridges.*—The report of the Highways Committee contained the following paragraph:—

"The Council on April 10 instructed us to consider and report on the feasibility of providing the lighting of Westminster and Waterloo Bridges by electricity apart from the question of illuminating the Victoria Embankment; and on a petition on the subject from the North London Liberal and Radical Club was referred to me. Having given very careful attention to this matter and availed ourselves of the assistance of Lieut. Col. Ford, on whose motion the reference was made we have come to the conclusion that in view of the very large extra expense that the establishment of a separate installation for the two bridges would involve, it is not advisable that the course indicated in the resolution of the Council should be adopted. The drawings for the generating station approaching completion, and it is anticipated that the installation will be completed in time for the Embankment and the bridges to be lighted by electricity next winter. We have still under consideration the question of the positions in which lamp-standards for the Embankment shall be placed, but in the meantime the other work can be proceeded with."



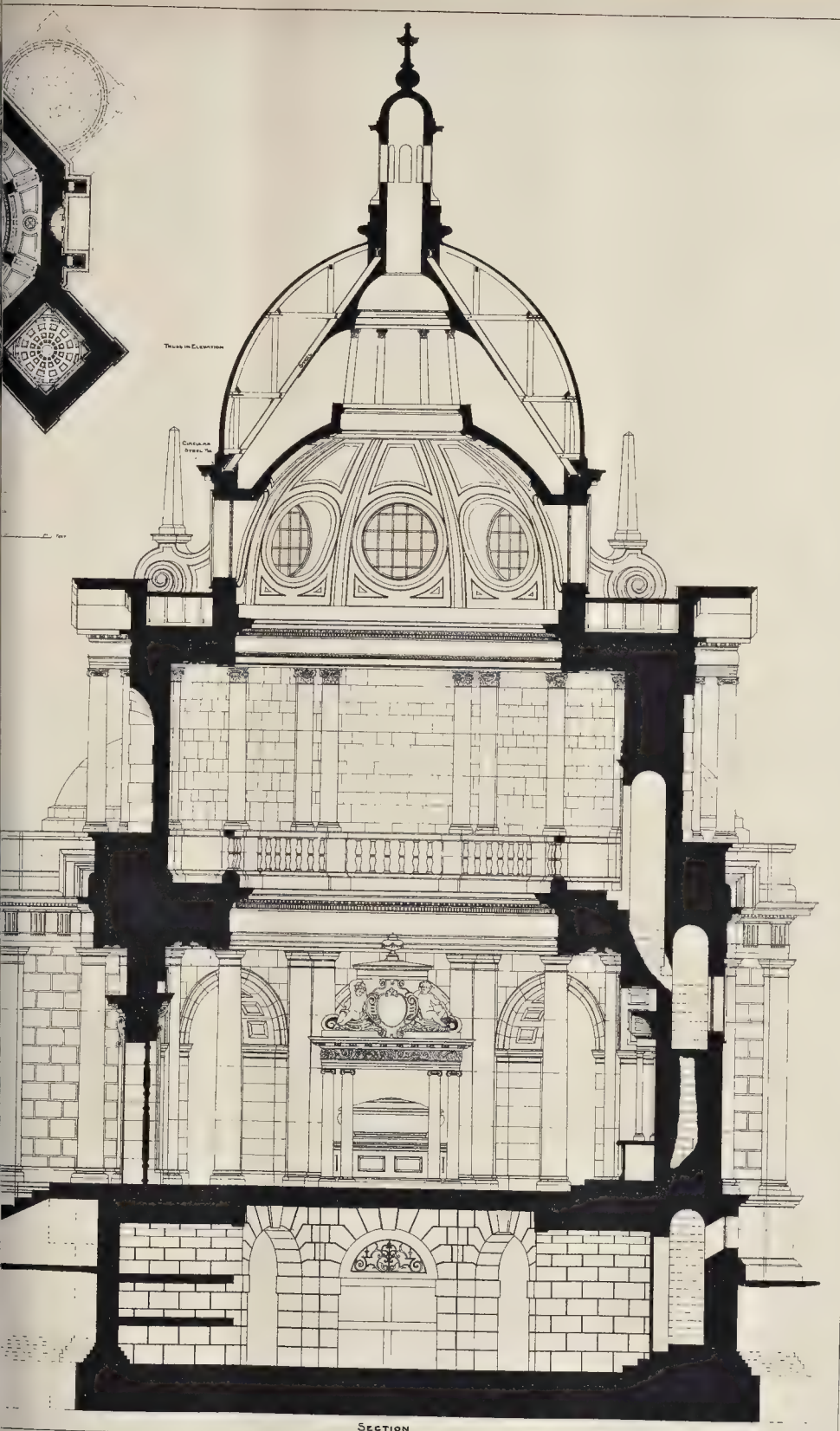


THE TITE PRIZE  
DESIGN FOR ROYAL MAUSOLEUM



ELEVATION

INCHES 1 1/2 2 3 4 5 6 7 8 9 10 11 12

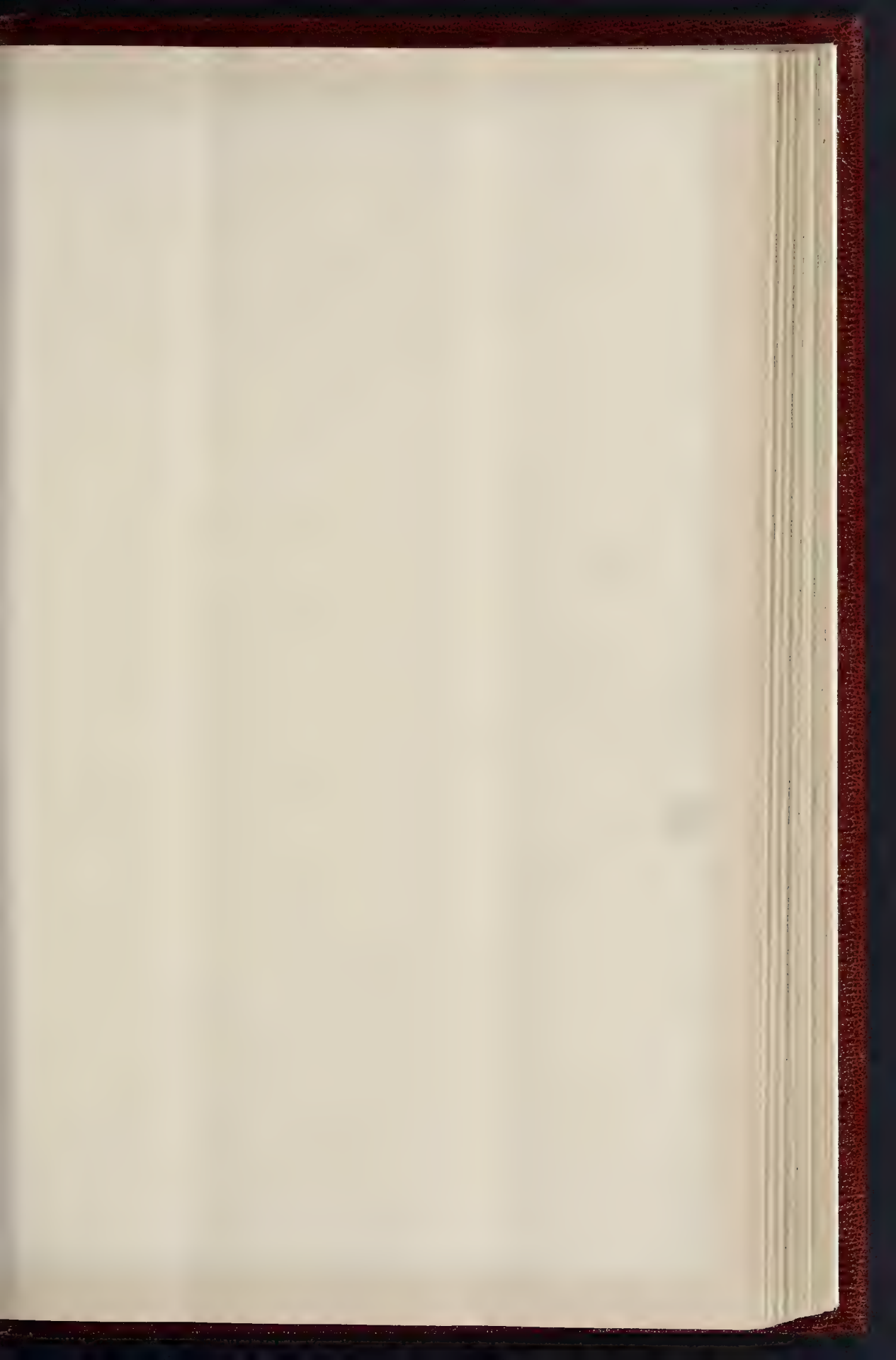


SECTION

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THE BUILDER MAY 12 1894





PERSEUS RESCUING ANDROMEDA—GROUP IN BRONZE MR HENRY C. FARR, SCULPTOR

*Royal Academy Exhibition, 1894*





**Lincoln's Inn Fields.** On the recommendation of the Parks Committee it was resolved that the Finance Committee be instructed to take the necessary steps to provide the money required in connection with the acquisition of Lincoln's Inn Fields.

**Workmen's Trains.**—The Public Health and Sanitation Committee recommended that a petition presented to the House of Commons, praying for an inquiry into the subject of workmen's trains of the operation of the Cheap Trains Act, 1883. The Committee stated that they felt satisfied that a further Parliamentary inquiry was necessary, and that they would recommend that they should be referred through a Select Committee or a Royal Commission, in order to ascertain—(1) the expediency necessary to the Cheap Trains Act; (2) whether the statements repeatedly put forward by promoters of new undertakings as to the local impossibility of running cheap workmen's trains were really well founded; (3) the best method of constructing railways leading into the suburbs; (4) as to the necessity for a special inspection of the metropolitan railways by a duly-authorized body with a view to the enforcement of obligations in the matter of workmen's trains; and (5) whether the Council was the right body to be charged with the duty. The recommendation was adopted.

**Millbank Prison Site.**—The Council, on the recommendation of the Public Health and Sanitation Committee, agreed to purchase a portion of the Millbank Prison site from the Government for the erection of working-class dwellings, the price to be paid being 2,500*l.* per acre. The Council at its rising adjourned until the 19th inst.

#### THE ASSOCIATION OF SANITARY INSPECTORS.

At the last monthly meeting of this Association, held at Carpenters' Hall on Saturday last, Thomas (Bermondsey), the Chairman of the Council, presiding, a paper on "Sewer and Drain Tilth" was read by Mr. W. W. West (Lathamstow Local Board). The reader of the paper attributed many of the defects existing in the methods of maintaining the efficiency of sewers and drains in the metropolitan area to a lack of control. A habit had grown up of confining sewers and drains as two distinct matters, to be treated independently under different management and ownership. In his opinion they should be considered as parts of one system of drainage under one control from the watercourse to the outfall, and he thought he saw signs of recent events of that unity of control which was so desirable. The ventilation of a house-drain was supposed to be perfect when a vent-pipe had been carried up above the roof and an outlet-pipe provided in the forecourt, with a seal trap to cut off communication; but never perfect such an arrangement was in reality, it was in practice either imperfect or useless. They could not ensure that the inlet would not sometimes act as an outlet and be a nuisance, nor that the outlet pipe would not sometimes become an inlet, and, therefore, as a ventilator, worse than useless. The sequence was that, ninety out of a hundred times, the air inlet, being found occasionally an offensive nuisance, was stopped up permanently. In a street of a hundred houses, in fifty of which the drains had been provided, in such a way, all but three were stopped up. In such a case, in spite of the up-cast shaft carried up above the roof, there was no ventilation of either the house-drain or the sewer, and in the few cases where the ventilation of the house-drain was effective, the effect on the ventilation of the sewer was nil. Turning to the attempts at sewer ventilation, the paper described the abortive attempts made to prevent the man-holes and lamp-holes from being a nuisance to all who pass them or live near them. In reply to reiterated complaints the speaker would be flushed to get rid of foul deposits which are supposed to cause the offensive smell, but the remedy was useless, for it was the passing air which emitted the offensive odours. Sulphuric acid was, in some cases, splashed over the face of the road round the man-hole—a merely temporary measure, as useless as it was wasteful. A small number of instances permission might, perhaps, be obtained to fix a rain-water pipe into a neighbouring house to act as an up-cast shaft, the offensive man-hole being closed. This might be more or less effectual for a short length of sewer, but it would be practically beneficial such a sewer would have to be excessively numerous, and they must be excessively ugly. Artificial ventilation had been tried in rare instances, but the success of such expedients, which were

necessarily costly, had not been sufficiently proved to warrant a general adoption of them. The remedy proposed by the lecturer was to close all the openings in front used as air inlets, to suppress the disconnecting traps, and convert the house drains and the sewer into one continuous system, which would be then ventilated from end to end by the upcast shafts, left wherever they had been put up and multiplied where not sufficiently numerous. That the greater intensity of the sewer gas would intensify the evil where drains were defective was admitted—but they must never be defective, for a defective drain was a danger to health, whether sewer gas had or had not access to it. The greater pungency of the sewer gas would have the advantage of more imperatively calling attention to defects in the drains. But with the system of more natural ventilation that would be obtained by the proposed plan, it was maintained that the sewer gas would become much more innocuous. The paper concluded with the following *résumé* of suggestions:—

1. Close all road surface openings.
2. Provide as many other openings as possible.
  - (a) At the higher end of each sewer.
  - (b) At all available points along its route.
  - (c) If possible, where sewers cross open spaces, provide extended openings, as blowholes, by which the air could enter the sewers.
3. Give the air in the sewers the benefit of the house drain ventilators (which are so often useless at present) by discontinuing the use of the intercepting traps.

We should thus gain all round. The house drain would be constantly ventilated; the cost of the downcast shaft and trap would be saved; the cost of the upcast shaft would be justified by its usefulness; the sewage would have an uninterrupted flow from the water-closet to the outfall, and the system of ventilation would be complete.

On the proposal of the usual vote of thanks a discussion arose, in which the Chairman and Messrs. Alexander, Young, Lightfoot, Tidman, Barham, Strutt, Saunders, and other members took part. The vote was carried by acclamation, and a conference followed upon the arrangements and the proceedings of the annual Congress to be held on the 11th and 12th inst. at Nottingham.

#### ARCHITECTURAL SOCIETIES.

**EDINBURGH ARCHITECTURAL ASSOCIATION.**—A meeting of the Edinburgh Architectural Association was held in the Royal Institution on the 2nd inst., Mr. W. W. Robertson presiding. Mr. Hippolyte J. Blanc, A.R.S.A., read a paper entitled "Ecclesiastical Architecture of Scotland, Fourteenth and Fifteenth Centuries." Mr. Blanc briefly sketched Scottish history in its architectural development up to the end of the thirteenth century, when the greater works in Scotland were completed. He then noticed the cessation of building enterprise during the long period succeeding the death of Alexander III., and took up the thread of architectural progress when Scotland began her new works in the beginning of the fourteenth century. He traced from examples in Belgium and France the characteristics of architecture there, and by a series of examples of English work during the period of Scotland's cessation from church building, showed how Scotland in her new works was more influenced by examples from England than from the Continent. The lecture was illustrated by a series of limelight views. Mr. Blanc received a hearty vote of thanks for his paper.—Twenty-five members, headed by the President, Mr. W. W. Robertson, visited Biel on Saturday last, permission having been previously obtained from Mr. and Mrs. Hamilton Ogilvy, of Biel and Archerfield. Mr. Thomas Ross, F.S.A. Scot., architect, read a few notes, in which he traced the family history, and pointed out that the mansion-house, although partly old, was done up by Mr. Atkinson, the architect, at the end of last century. The visitors were then conducted through the house and chapel. The grounds were next visited, and the President, having proposed a vote of thanks to Mr. Ogilvy, who replied, a visit was paid to Stenton Church. The ruins of the old church were inspected, and a visit paid to the interior of the modern one. An old road well close at hand was also viewed previous to returning home.

**CLOCK, SOUTH MOLTON, NORTH DEVON.**—A large clock has just been erected in the parish church of South Molton. It shows the time on one 7-ft. dial, strikes the Cambridge quarters upon four bells, and chimes the hours. Messrs. John Smith & Sons, Midland Clock Works, Derby, have carried out the work.

#### ENGINEERING SOCIETIES.

**SOCIETY OF ENGINEERS.**—At a meeting of the Society of Engineers, held at the Town Hall, Westminster, on Monday evening, Mr. George A. Goodwin, President, in the chair, a paper was read by Mr. R. Nelson Boyd on "A Deep Boring near Freistadt, Austria, by the Canadian System." The author described the American rope system, and the Canadian, in which ash poles or rods are used. After a somewhat detailed description of the machinery adopted at the deep boring, he proceeded to state that this work was undertaken for the purpose of proving an unknown portion of the Ostrau-Karwin coal-fields in Austria, which is a continuation of the Prussian Silesian coal-field. This part of the coal-field is covered by a tertiary deposit of clay, which the local geologists assimilate to the Vienna basin, and which varies in thickness from a few feet to several hundred yards. The object of the bore-hole was to penetrate through this deposit of clay and discover the coal measures. A bore-hole had already been put down in the neighbourhood to a depth of 710 ft. into the clay without passing through it, and therefore the proposed boring was expected to be one of considerable depth. The diamond drill was first selected, but could not be applied owing to an insufficiency of water, and eventually the Canadian rig was adopted. The author then proceeded to describe the process of boring, the difficulties which had to be overcome, and the manner of lining the bore-hole. In the course of the sinking, a spring of water, charged with bromide and iodide salts, was cut at a depth of 1,010 ft. Inflammable gas was first observed at a depth of 960 ft. The boring was continued down to a depth of 2,011 ft. 6 in. without passing through the clay deposit. It was accomplished in one year five months and five days. The actual drilling averaged 10 ft. 6 in. in twenty-four hours' work. In conclusion, the author observed that, taking one consideration with another, the Canadian system has many advantages. In drilling through highly inclined measures it is preferable to the rope system, and by the use of the jars a much greater rapidity of drilling is attained than with the free-fall method. Lastly, in soft ground, it is possible to obtain an approximate section, which could not be secured by the diamond drill.

**LIVERPOOL ENGINEERING SOCIETY.**—The annual general meeting of this Society was held at the Royal Institution on the 2nd inst., Mr. H. Percy Boulton, M.Inst.C.E., President, occupying the chair. The annual report of the Council and the hon. treasurer's statement were read and approved. Professor H. S. Hele-Shaw, M.Inst.C.E., of University College, Liverpool, was unanimously elected President for the next Session. The remainder of the evening was devoted to the adjourned discussion on a paper read at the previous meeting by Mr. Thomas Duncanson, Assoc.M.Inst.C.E., entitled, "Notes on the Distribution of Water Supplies."

#### Correspondence.

To the Editor of THE BUILDER.

#### ARCHITECTS AND FURNITURE.

SIR,—I find that some misconception has been put upon an expression that I made use of at the meeting held at the Institute on the subject of "Furniture." In the *Builder* of April 28, which contains the best report of the proceedings, I am correctly made to say, "That the Art Committee endeavours to choose subjects which will be helpful to the art of Architecture, and broaden the views of the architect, taking his nose out of drains and traps and sanitary matters." By this I wish to imply in contradistinction to the unfortunate remarks by a previous speaker that there are other and sweeter things to which an architect may, with advantage, turn his attention than drains, traps, and building materials. I have, of course, no desire to discourage the very proper study of sanitary matters, but so engrossing and out of all proportion has been the study of this subject, that any one who, like myself, looks upon architecture as an art is forthwith dubbed with the ridiculous and offensive title of "art architect." If an architect is, as he should be, an artist he is supposed by some to neglect part of his work as though it were possible to be an architect without knowledge and interest in the science of his art.

Really it would seem that the refrain of a popular music hall song may be applied to the



modern architect, either in pity or sarcasm, who is ignorant of his exact position.

JOHN BELCHER.

### THE HEATING AND VENTILATION OF THE HOUSES OF PARLIAMENT.

SIR,—Replying to your editorial note, I would say—

1. The air sent in from below goes up for a distance, naturally, towards the top, but the stronger extraction under the side galleries would drag a portion over to each side immediately over the heads of members, in the manner I show on coloured section in report, as well as extract the air from amongst the body of members on both sides.

2. There being all the galleries to ventilate, there must also be a top extraction, in the special circumstances, but, both the top and proposed side extraction going into the same main extract shaft in lower basement, no great adjustment would be necessary, seeing extraction would be going on from both points, the side extraction only being the stronger of the two, for the reasons stated in my previous letter.

3. It must be borne in mind that there is a constant pressure, outwards, in the House of Commons debating chamber and division lobbies, and that more air is blown in than the extracts at ceiling would—if diminished as recommended—take away under ordinary atmospheric pressure, therefore, part of the fresh air would be pulled over to each side almost exactly as shown on diagram.

4. The side inlets could only be increased so as to send more air in from the sides over the heads of members, which would immediately be drawn out again at ceiling level after only sweeping lower side of galleries, and would not affect the vitiated air held under pressure where the majority of members sit.

5. The only way in which propulsion would so far meet the case would be to revert to the original plan of having the whole floor-area of the House grated; but even this would not be altogether effectual, and it would certainly not be satisfactory. Years of experience have already shown that such a plan would not be tolerated by the occupants of the side benches, who would have to sit directly over the incoming air.

JAMES KEITH,

Assoc. M. Inst. C.E.

\* Our correspondent's last remark only confirms what we have said, that the ventilation should be radically re-constructed. To say that it cannot be done under propulsion in any way but through the grated floor is absurd; it may be true that it cannot be done without important structural alterations.—Ed.

SIR,—Your admirable leader upon Mr. James Keith's report of the above is, in itself, sufficient to show that public money would be simply wasted if his suggestions were carried out; but as Mr. Keith, in his letter published in your last issue, states, "He never knew of a system of propulsion pure and simple that effected an efficient and satisfactory ventilation of any large building," and then proceeds to again advocate both propulsion and extraction for the House of Commons—one is goaded to ask how far his observations of buildings, ventilated on the *plenum* principle extend, and on what grounds of fitness he has been selected to report on this most important subject?

It would be interesting if Mr. Keith would inform you where the volume of air is to come from which he proposes to extract, in addition to the volume to be forced in; and whether he can see his way to cleanse such additional amount and regulate its temperature and humidity or guarantee its purity.

It appears to me he has not grasped the elementary fact; that when the House of Commons is full of air, the forcing in of an additional amount must displace an equal volume.

The object of any system of ventilation is to do that in such a way that a constant change in the whole air of the apartment takes place without causing discomfort to the occupants by draughts. Therefore the problem is to distribute a sufficient volume of air—properly cleansed and tempered as regards both heat and humidity—throughout the apartment; and to provide outlets therefrom in such positions and so contrived, that the air may, after being vitiated, quickly pass away without being obstructed or accelerated by movement of the outer atmosphere or any other influence.

Judging from Mr. Keith's own statements, it

may be news to him to learn that there are several buildings in this country, efficiently ventilated by a "system of propulsion, pure and simple."

Not to trench unduly on your space, I refer Mr. Keith and others interested in this subject to the last issue of the Royal Institute of British Architects' Transactions, which contains some general views on ventilation in a paper of mine on "Hospitals."

The method now employed at the Houses of Parliament is literally upside down, and as you justly say, nothing short of a "reconstruction of the whole system at one coup," is likely to prove satisfactory.

WILLIAM HENMAN, A.R.I.B.A.

### "STUDENT'S COLUMN."

SIR,—Will you kindly say what is the name of the quarries at points No. 1 and 2, fig. 14, March 37? If Swanage and Langton? Also, what are the names of quarries, fig. 20, April 14? You refer to the micro-sections by name of quarry, and give no indication which No. they belong to on map.

In the Portland district you have not given any of your absorption tests; are you giving them later on, as in the next article, XVI., you pass on to No. 3, Tisbury district.

C. F. B. SHILLITO.

\* We could not very well give the names of the whole of the quarries in the Purbeck beds of the Isle of Purbeck, seeing that there are about fifty of them—as stated in the article. The points marked 1 and 2 (fig. 14) indicate two good centres of activity, and several quarries are near those points. We may say, however, that the micro-section illustrated in fig. 15 was from a sample collected at the Cowleaze quarry, belonging to Mr. George Burt; whilst that in fig. 16 was from a quarry in the immediate vicinity having no special designation. The quarries at point 2 are known generically as Langton South Quarries.

Our correspondent's second query, as to the names of the quarries numbered in fig. 15, is connected with his third query, respecting the Portland-stone absorption tests, and the answer to both is that further particulars will appear in a separate article in our columns shortly. We may say, beforehand, that the micro-section in fig. 21 (Wakeham) is from point No. 1; fig. 22 (Tut) is from point No. 13; and the Touthfield quarries are No. 12 on the map.

### "BOILER EXPLOSIONS."

SIR,—Having read the various correspondence that has appeared from time to time in your valuable journal, we are very much surprised to note that the main question has, in our opinion, been entirely lost sight of, and drifted into a discussion between Messrs. Jones and Buchan, as to whether "Water Freezes from the top downwards or otherwise" instead of keeping to the fact, that before a boiler or pipes can burst, there must be an excess of pressure, either caused through a stoppage in the system by furred-up pipes, or frozen air-pipes, water-supply pipe, or circulating pipes, and the omission of a relief in the shape of a dead-weight safety-valve fixed on a pipe direct from the boiler, and weighted slightly in excess of the vertical head of water. In the majority of cases in which accidents have occurred this has been innocently caused through our friends the architects and clients entrusting their hot-water circulating supply services and heating installations to plumbers and builders who profess to be competent to execute this class of work in conjunction with numerous other branches of the building trade, viz., painting, carpentering, drainage, plumbing, gas-fitting, &c., whereas we find that firms who specially lay themselves out for hot-water work in general do not attempt to execute plumbing work of any kind, such work needing as much special forethought and study to be carried out satisfactorily as hot water work in its numerous forms; this latter work being such as to demand a special and practical knowledge if it is to be carried out in a safe and satisfactory manner, as no two schemes are the same excepting in buildings constructed from the same plans, and what answers well in one case would have to be varied in others to obtain a like good result.

It would be well if plumbers would confine themselves to their plumbing works, such as cold water supplies and sanitary works in connexion with the waste-pipes from the various apparatus fixed by them, and leave hot water to the specialists or hot water fitters, when boiler explosions would be reduced to a minimum, and complaints about not getting hot water, and noises in the hot water pipes, would virtually cease.

"ÆOLUS."

SANITARY INSTITUTE EXAMINATION.—At an examination for Inspectors of Nuisances, held at Durham on April 27 and 28, twenty-six candidates presented themselves. Questions were set to be answered in writing on the 27th, and the candidates were examined *visu et vocu* on the 28th. Eighteen candidates were certified to be competent, as regards their sanitary knowledge, to discharge the duties of Inspector of Nuisances.

## The Student's Column.

### THE STRUCTURE AND PHYSICAL PROPERTIES OF BUILDING STONES.—XIX.

#### MICRO-STRUCTURE OF BATH STONE (Continued).

HAVING given a brief outline of the micro-structure of the Bath stones as a whole, we may now proceed to describe appearance under the microscope of those specific areas in the Bath district, following order laid down in the last article.

#### a.—Bath Area.

The building stones raised on Odd Down Coombe Down are, on comparison with other Bath stones, characterised by the possession of opaque or semi-opaque granules in which a centric structure is not very apparent either reflected or transmitted light, though they evidently well formed. The general structure is exhibited in the accompanying diagram (fig. 27). The granules are variable

FIG. 27

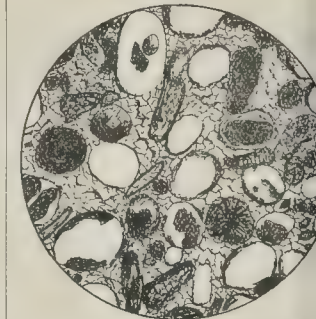


FIG. 27.—Micro-structure of Coombe Down Bath Stone. (Stone Mine near Prior Park.)

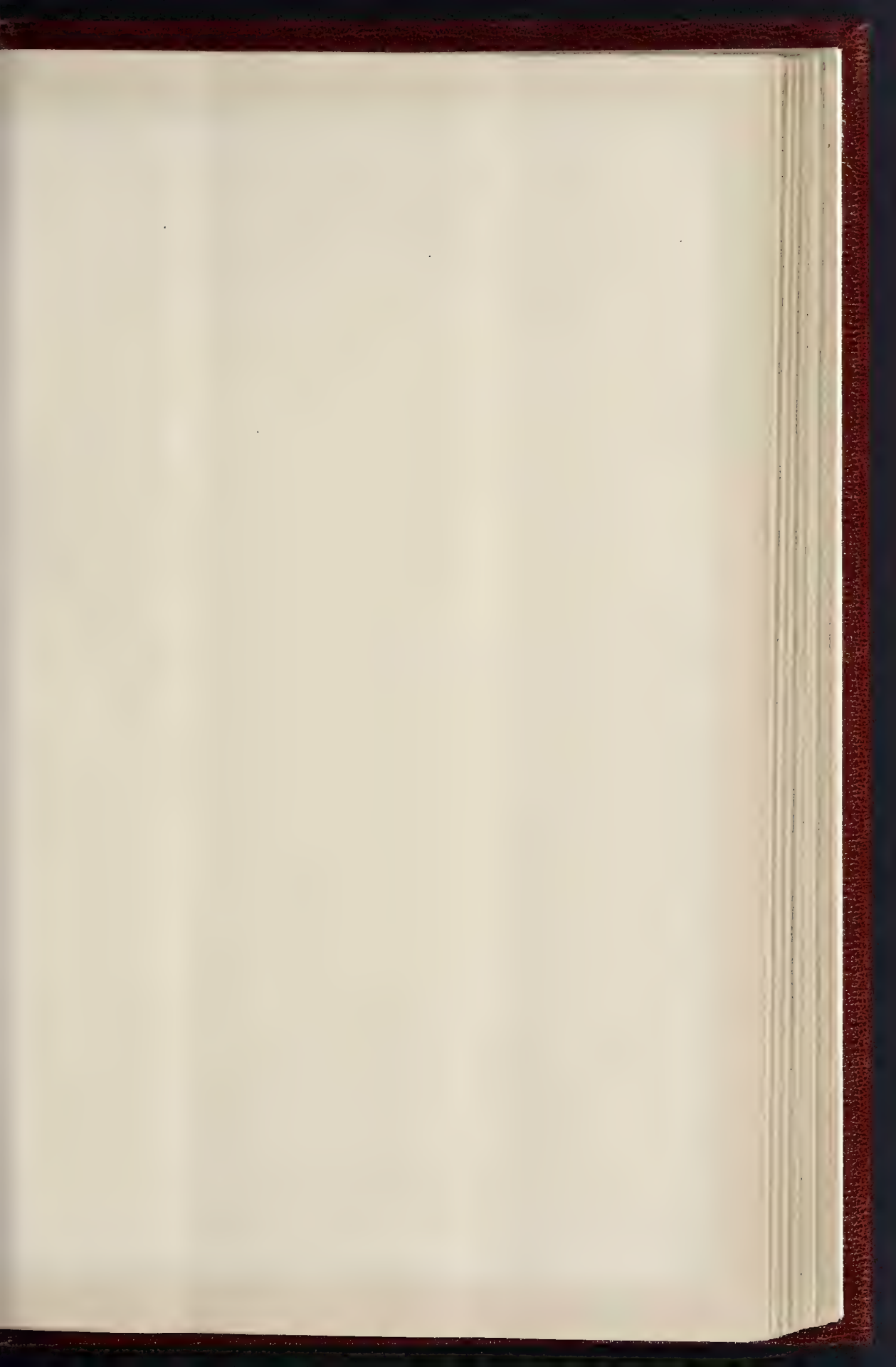
size, ranging from mere shot-like specks up to enormous pieces; they are rarely in contact with each other. Pieces of shell, and foreign matter generally, are not so abundant as in some other Bath stones, but skeletonised, elongated fragments of shell, which, possibly, were originally composed of aragonite, are not locally. The matrix is extremely abundant; made of calcite fairly crystallised and in large crystals, but it is decomposed in places.

The student will observe that several ovoid patches are depicted in the above illustration (fig. 27). These represent holes originally occupied by oolitic granules which have appeared in the process of preparing the stone for examination. It would be useless to attempt to restore them, and their absence serves to remind us that the granules in the Coombe Down stone are very earthy—hence their opaque appearance. We may add that similar clear spaces exist in stones represented in figs. 28, 29, and 30, that this is, in fact, characteristic of many varieties of Bath stone. The sample shown in fig. 27 is by no means abnormal; its structure, as indicated, is common to all the stones on Odd and Coombe Downs.

Another peculiarity of Coombe Down stone is that some of the oolitic granules appear to have shrunk, or to have lost their outer coatings, and they were first enveloped by the matrix, in consequence of which they are now lying loose in cavities. From the foregoing observations the student will readily understand that the weathering of Coombe Down stone entirely depends on the durability of the matrix; it is fortunate that this is so crystalline. The matrix of the stone from Prior Park quarry is slightly siliceous; that from another, close by, is not as abundant as usual, and exists in string-like courses.

#### b.—Limpley Stoke Area.

The stone from this area differs in micro-structure from that in the Bath area in at least three essential points, viz., the oolitic granules are more transparent, so that their structure in many cases can be clearly made out; open spaces, or removal of granules are not so frequent; whilst the matrix is finer and more granular and it is with difficulty that individual calcite crystals are made out. The appearance of a typical slice of the Stoke Groundstone (as it





THE BUILDER, MAY 12, 1894.





THE PHOTO BRASSERIE LTD. 45, 47, 49, 51, AND 53, MARKET STREET, LONDON, E.C. 4.

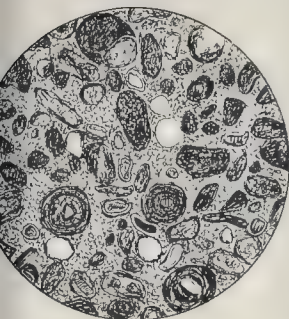
ST. CUTHBERT'S CHURCH, EDINBURGH, IN COURSE OF ERECTION.—MR. HIPPOLYTE JEAN BLANC, ARCHITECT.





d) is represented by fig. 28. It will be observed that small shell fragments are tolerably abundant, and that they are occasionally

FIG. 28.



28.—Micro-structure of Stoke Ground Bath Stone.

tonised. The particles are smaller on an average than in the Coombe Down stone.

c.—Winsley Area.

The structure of stone from this area was described in these columns on a previous occasion, though in a different connexion (*ante*, p. 221, plate, fig. 8). It may be distinguished from the Bath stones already mentioned, in that its oolitic granules are of a brown tint, and are well formed; but they are not particularly numerous, and are somewhat decomposed, whilst shell fragments, coated with siliceous layers, predominate. The matrix is siliceous, but much cut up. Fragments of shells are abundant.

d.—Bradford-on-Avon Area.

I did not visit the two or three small quarries in this area, but, judging from samples of stone sent, the material appears to be somewhat different from the Winsley Ground.

e.—Westwood Area.

Stones from this area were figured and described in another connexion, *ante* p. 221, figs. 6 and 9. It may be remarked that Westwood "paving bed" (fig. 6) is a shelly one devoid of oolitic structure, and in this it differs from all other Bath stones. The Westwood Ground (fig. 9) contains larger oolitic granules and fragments than any other stone in the series; the former are beautifully clear; the latter remains very abundant, but the matrix is much decomposed.

f.—Monkton Farleigh Area.

Oolitic granules of the stone in this area have a more structure than in either of the stones previously described; they are of a dark brown tint, and otherwise have a general resemblance to that of the Coombe Down, as will be seen on comparing fig. 29 with fig. 27.

FIG. 29.



29.—Micro-structure of Farleigh Down Bath Stone. (From Farleigh Down Quarry.)

Farleigh Down stone has also a somewhat different matrix, and it is much more decomposed. The granules are so earthy as to have been used in the preparing process. It appears rather variable in regard to the relative abundance of shelly matter. The sample

depicted, from a quarry in the centre of the area, has many foreign fragments, but the same bed only a few hundreds of yards off is practically free from them, being in fact an excellent example of an oolite, though its matrix is, unfortunately, very much decomposed.

In the north of the area, on Kingsdown, the Longspitt quarries are situated. The stone here is very peculiar; we have already illustrated and described a section (*ante*, p. 221, plate, fig. 10.) From that figure which was taken from the "fine-grained" bed, it will be seen that the oolitic granules are frequently hexagonal in outline, a circumstance most difficult to explain, whilst the little matrix present is much decomposed. The stone from the "Oaty" bed in the same quarries, is intermediate in structure between the Farleigh and Box Ground stones, except that the oolitic granules appear to be more earthy (semi-opaque) than in either of them.

g.—Box Area.

The normal Box Ground stone may be distinguished from all other Bath stones microscopically, by the preponderance of what we have called skeletonised elongated shell fragments, as will be seen on reference to fig. 30. We may

FIG. 30.

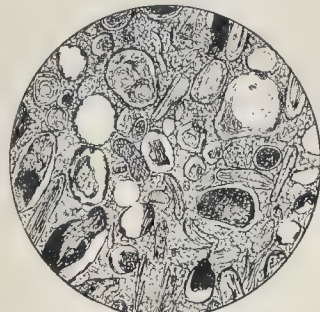


FIG. 30.—Micro-structure of Box Ground Bath Stone. (From Tynning Quarry.)

pause for a moment to describe these. They usually appear in outline only, their internal structure having for the most part been removed and replaced by granular calcite of precisely similar character to that of the matrix. Occasionally even their outlines are indistinct, and the whole may then be likened to shadows of shell fragments; indeed, it is only constructively by observing all the gradations from a perfect fragment that we are able to pronounce definitely on their real character. Otherwise, the Box Ground resembles the Coombe Down stone, though the oolitic granules of the former are much more transparent and crystalline than in the latter; whilst its matrix is not so abundant or well-preserved except in certain of the quarries. When this matrix is not in any way decomposed, the Box Ground must be a durable stone, especially where, as at the Clift quarry, it is slightly siliceous.

h.—Corsham Area.

Corsham Stone, properly so-called, is the most readily distinguished of all the Bath stones. In micro-sections its oolitic granules are seen to be

FIG. 31.

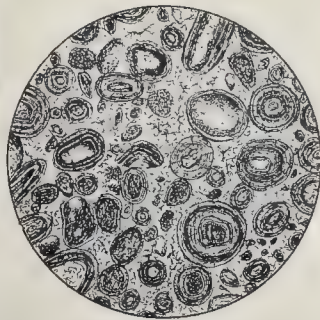


FIG. 31.—Micro-structure of Corsham Bath Stone. (From Corsham Down Quarry—"Bottom" bed.)

of a bronze tint; they are perfectly formed, rather distantly situated, foreign matter is rare, matrix fresh, minutely granular and occasionally merging into the granules, which are thus rather rugged in outline. Our illustration (fig. 31) is from a typical specimen.

Another feature is that under the polariscope each granule often exhibits a perfect cross, such as is seen in what is known by petrologists as spherulitic structure. Two of the samples from the Corsham Down, and six specimens were obtained at Spring and Huddswell quarries have a slightly siliceous matrix; and we are of opinion that they are good and durable freestones, though we cannot say as much for some other Corsham stones not possessing either such crystalline granules or a matrix of the character described.

One specimen from Huddswell, and another from Spring quarry resemble in structure the Longspitt "fine-grained" bed, with its oolitic granules hexagonal in sections.

The Hartham Park stones, being obtained from so many different beds, naturally vary in structure. What is known as Hartham Park Corsham stone appears to be an oolite derived in part from a pre-existing oolite, as it contains so many rolled patches of granules. Its matrix is very finely granular, and hazy in places; as a whole, it resembles the typical Corsham. The Hartham Park Ground stone is more crowded with granules and fragments than any other from the Bath district, but what matrix there is is crystalline. The "scallott" bed is a true oolite, very even in grain, with well-formed, distant, and transparent brown granules of the Corsham type; the matrix is superabundant, finely crystalline, and slightly siliceous—not a bad stone, we should think.

"Corngrit" is another variety of Corsham stone, so called from the local occurrence of small hard patches in it. Its micro-structure exhibits the Corsham types of granules, and plenty of them, interspersed with roughly-shaped fragments of mollusca, bryozoa, and crinoids. The matrix is rather dense, and presents the appearance of having been much decomposed, and subsequently re-constructed so as to be more crystalline than it was originally.

i.—Monk's Park Area.

Typical Monk's Park stone is precisely similar to that from Corsham Down, Spring, and Huddswell quarries in micro-structure, except that its matrix is in general more siliceous. Monk's Park is both geographically and structurally a Corsham stone. The "Ridge" Corsham has not such an abundant matrix; whilst we can detect no difference between the Park Lane stone and that from the typical Corsham area, save that its matrix does not contain silica.

#### OBITUARY.

MR. F. R. WILSON.—On the 6th inst. the death occurred of Mr. Frederick Richard Wilson, architect, of Alnwick. Previous to coming to Alnwick, says the *Newcastle Chronicle*, he served a six years' apprenticeship with Mr. Cottingham in London, and afterwards went to the offices of Sir Charles Barry, when the Houses of Parliament were in course of erection. On leaving Sir Charles Barry Mr. Wilson secured an engagement under Mr. Salvin. When Mr. Wilson went to Alnwick he acted as *locum tenens* for Mr. Salvin, and took charge of constructive and decorative works carried on at that period by the Duke of Northumberland at Alnwick Castle. He soon after visited Italy and Rome. He was elected a member of the Local Board in 1863, and was on several occasions returned to office. For twelve years he was a member of the Board of Guardians. For twelve years, after ceasing to be a guardian, he was Sanitary Inspector and Surveyor to the Alnwick Union Rural Sanitary Authority, and during his term of office he carried out various works of sewerage and water supply. Amongst many other architectural works due to Mr. Wilson are the restoration of sixteen churches in Northumberland, one in North Wales, and one in Kent; also new churches, vicarages, manses, cottages, mission-halls, and schools. He was connected with Mr. W. Topley, F.G.S., in producing a "hydro-geological map of the district of Alnwick." Amongst other publications which issued from his pen perhaps the most noteworthy is "The Churches of Lindisfarne." He was a member of the Berwickshire Naturalists' Club; and was also Diocesan Surveyor of Ecclesiastical Dilapidations for the Archdeaconry of Lindisfarne, in the Diocese of Newcastle, until his resignation through ill-health in 1892. He was for some time President of the Northern Architectural Association.

PREMISES, SHEFFIELD.—Messrs. Newton, Chambers, & Co. have just opened new premises at the corner of Union-street and Furnival-street, Sheffield, the architects being Messrs. Flockton & Gibbs.



**STEEL CHAINS.**—The Weldless Chain Co. St. Helens, send us a catalogue and sample their form of chain called the "Triumph," in which the links are made without welding. The cost of Bessemer steel wire, of great strength for the weight, is reduced, and each link is formed by drawing such steel wire doubled and twisted or knotted to the head of the next link in a special manner, which is patented as well as the machine carrying it out. The double result of this is that there is no welding in the link, and the chain is closely knotted, and each link is so strong that there is no danger of its breaking. We do not say that this knotted system looks as neat as a welded chain; we do not think it does; but it has important practical advantages. The manufacturers also send us specimens of various patent attachments, swivels, shackles, &c. This scaffold pole has been shown in the catalogue, with the one end, pointed hook and the other, for fastening up staging and scaffolding, ought to be useful.

**A WAGES TABLE.**—"Mitchell's Hourly Wages Table," printed on a large card, gives at a glance the amounts made up by wages from 10 to 25 shillings, for periods from one hour to 100 hours. It will be useful to those who have to reckon up in fractional wages.



MAY 4.—By *Weston & Son*: 23, St. John's-rd.,  
Brixton, rd. 68 yrs, g.r. 101, r. 631, 5201; 39, 49, 51,  
Pk-rd, Dulwich, rd. 52 yrs, g.r. 201. 35, r. 1111, 6601.—  
By *Benningfield, Tidy, Norris, and Duvall*: The f.  
residence "Presdales", of 65 acres, Great Amwell, Herts,  
3,001.—By *Towers, Ellis, & Co.*: 43, Tavistock-rd.,  
Notting Hill, rd. 69 yrs, g.r. 101, r. 361, 3001; 12,  
Frederick-cr., Brixton, rd. 67 yrs, g.r. 501, r. 281,  
2401.—By *Edwin Evans*: 27, 29, Stile Hall Gardens, Kew







WINDSOR.—For domestic offices for No. 9, York place,  
Windsor, for Mr. Arthur Sharpe. Mr. John Geo. Carey, architect.  
Windsor.—  
L. & W. Dickinson.....£138 0 | E. Bamfylde .....£88 10  
H. Reavell ..... 118 0 | All of Windsor.]



WORSBROUGH (Yorkshire).—Accepted for the erection of school buildings and house, for the School Board. Messrs. Senior & Co., architects, 25, Regent street, Burlington. Estimate by architect.

Masons' work.—Higham & Porter, Barnsley. £1,383 9 3  
 Carving of wood.—W. G. S. & F. N. (thanks not required).  
 Errors, Worsbro Dale ..... £1,182 10 0  
 Plasterers' work.—W. G. S. & F. N. (thanks not required).  
 Masons' work.—E. Fleming, Barnsley ..... 268 0 0  
 Painters' work.—Wm. Todd, Barnsley ..... 43 0 0

WRAGBY (Lincoln).—For the erection of Wesleyan Chapel, schoolroom, &c. Mr. Jno. Wells, architect, Victoria Chambers, Derby. £1,437 5 0  
 M. Hatfield ..... £1,343 0 0  
 M. Otter & Co. .... 1,432 0 0  
 T. Wilkinson ..... 1,320 0 0  
 J. M. Thompson & Co. .... 1,247 0 0  
 A. B. Wright ..... 1,357 0 0  
 S. Sherwin ..... 1,359 0 0  
 \* Accepted.

WROTHAM (Kent).—For building new farmhouse near Wrotham. Kent. Mr. St. Pierre Harris, architect, 1, Broughall-street, E.C. Estimate by architect. £1,095  
 Sonnerford & Son ..... £1,095  
 Catlett (accepted) ..... £1,010  
 Stebbings & Fannett ..... 1,045

YORK.—Accepted for sewerage, levelling, paving, &c. Kidd's terrace and four streets for the Corporation. Mr. Alfred Cree, Engineer, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35, 36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53, 54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71, 72, 73, 74, 75, 76, 77, 78, 79, 80, 81, 82, 83, 84, 85, 86, 87, 88, 89, 90, 91, 92, 93, 94, 95, 96, 97, 98, 99, 100, 101, 102, 103, 104, 105, 106, 107, 108, 109, 110, 111, 112, 113, 114, 115, 116, 117, 118, 119, 120, 121, 122, 123, 124, 125, 126, 127, 128, 129, 130, 131, 132, 133, 134, 135, 136, 137, 138, 139, 140, 141, 142, 143, 144, 145, 146, 147, 148, 149, 150, 151, 152, 153, 154, 155, 156, 157, 158, 159, 160, 161, 162, 163, 164, 165, 166, 167, 168, 169, 170, 171, 172, 173, 174, 175, 176, 177, 178, 179, 180, 181, 182, 183, 184, 185, 186, 187, 188, 189, 190, 191, 192, 193, 194, 195, 196, 197, 198, 199, 200, 201, 202, 203, 204, 205, 206, 207, 208, 209, 210, 211, 212, 213, 214, 215, 216, 217, 218, 219, 220, 221, 222, 223, 224, 225, 226, 227, 228, 229, 230, 231, 232, 233, 234, 235, 236, 237, 238, 239, 240, 241, 242, 243, 244, 245, 246, 247, 248, 249, 250, 251, 252, 253, 254, 255, 256, 257, 258, 259, 260, 261, 262, 263, 264, 265, 266, 267, 268, 269, 270, 271, 272, 273, 274, 275, 276, 277, 278, 279, 280, 281, 282, 283, 284, 285, 286, 287, 288, 289, 290, 291, 292, 293, 294, 295, 296, 297, 298, 299, 300, 301, 302, 303, 304, 305, 306, 307, 308, 309, 310, 311, 312, 313, 314, 315, 316, 317, 318, 319, 320, 321, 322, 323, 324, 325, 326, 327, 328, 329, 330, 331, 332, 333, 334, 335, 336, 337, 338, 339, 340, 341, 342, 343, 344, 345, 346, 347, 348, 349, 350, 351, 352, 353, 354, 355, 356, 357, 358, 359, 360, 361, 362, 363, 364, 365, 366, 367, 368, 369, 370, 371, 372, 373, 374, 375, 376, 377, 378, 379, 380, 381, 382, 383, 384, 385, 386, 387, 388, 389, 390, 391, 392, 393, 394, 395, 396, 397, 398, 399, 400, 401, 402, 403, 404, 405, 406, 407, 408, 409, 410, 411, 412, 413, 414, 415, 416, 417, 418, 419, 420, 421, 422, 423, 424, 425, 426, 427, 428, 429, 430, 431, 432, 433, 434, 435, 436, 437, 438, 439, 440, 441, 442, 443, 444, 445, 446, 447, 448, 449, 450, 451, 452, 453, 454, 455, 456, 457, 458, 459, 460, 461, 462, 463, 464, 465, 466, 467, 468, 469, 470, 471, 472, 473, 474, 475, 476, 477, 478, 479, 480, 481, 482, 483, 484, 485, 486, 487, 488, 489, 490, 491, 492, 493, 494, 495, 496, 497, 498, 499, 500, 501, 502, 503, 504, 505, 506, 507, 508, 509, 510, 511, 512, 513, 514, 515, 516, 517, 518, 519, 520, 521, 522, 523, 524, 525, 526, 527, 528, 529, 530, 531, 532, 533, 534, 535, 536, 537, 538, 539, 540, 541, 542, 543, 544, 545, 546, 547, 548, 549, 550, 551, 552, 553, 554, 555, 556, 557, 558, 559, 560, 561, 562, 563, 564, 565, 566, 567, 568, 569, 570, 571, 572, 573, 574, 575, 576, 577, 578, 579, 580, 581, 582, 583, 584, 585, 586, 587, 588, 589, 590, 591, 592, 593, 594, 595, 596, 597, 598, 599, 600, 601, 602, 603, 604, 605, 606, 607, 608, 609, 610, 611, 612, 613, 614, 615, 616, 617, 618, 619, 620, 621, 622, 623, 624, 625, 626, 627, 628, 629, 630, 631, 632, 633, 634, 635, 636, 637, 638, 639, 640, 641, 642, 643, 644, 645, 646, 647, 648, 649, 650, 651, 652, 653, 654, 655, 656, 657, 658, 659, 660, 661, 662, 663, 664, 665, 666, 667, 668, 669, 670, 671, 672, 673, 674, 675, 676, 677, 678, 679, 680, 681, 682, 683, 684, 685, 686, 687, 688, 689, 690, 691, 692, 693, 694, 695, 696, 697, 698, 699, 700, 701, 702, 703, 704, 705, 706, 707, 708, 709, 710, 711, 712, 713, 714, 715, 716, 717, 718, 719, 720, 721, 722, 723, 724, 725, 726, 727, 728, 729, 730, 731, 732, 733, 734, 735, 736, 737, 738, 739, 740, 741, 742, 743, 744, 745, 746, 747, 748, 749, 750, 751, 752, 753, 754, 755, 756, 757, 758, 759, 760, 761, 762, 763, 764, 765, 766, 767, 768, 769, 770, 771, 772, 773, 774, 775, 776, 777, 778, 779, 780, 781, 782, 783, 784, 785, 786, 787, 788, 789, 790, 791, 792, 793, 794, 795, 796, 797, 798, 799, 800, 801, 802, 803, 804, 805, 806, 807, 808, 809, 810, 811, 812, 813, 814, 815, 816, 817, 818, 819, 820, 821, 822, 823, 824, 825, 826, 827, 828, 829, 830, 831, 832, 833, 834, 835, 836, 837, 838, 839, 840, 841, 842, 843, 844, 845, 846, 847, 848, 849, 850, 851, 852, 853, 854, 855, 856, 857, 858, 859, 860, 861, 862, 863, 864, 865, 866, 867, 868, 869, 870, 871, 872, 873, 874, 875, 876, 877, 878, 879, 880, 881, 882, 883, 884, 885, 886, 887, 888, 889, 890, 891, 892, 893, 894, 895, 896, 897, 898, 899, 900, 901, 902, 903, 904, 905, 906, 907, 908, 909, 910, 911, 912, 913, 914, 915, 916, 917, 918, 919, 920, 921, 922, 923, 924, 925, 926, 927, 928, 929, 930, 931, 932, 933, 934, 935, 936, 937, 938, 939, 940, 941, 942, 943, 944, 945, 946, 947, 948, 949, 950, 951, 952, 953, 954, 955, 956, 957, 958, 959, 960, 961, 962, 963, 964, 965, 966, 967, 968, 969, 970, 971, 972, 973, 974, 975, 976, 977, 978, 979, 980, 981, 982, 983, 984, 985, 986, 987, 988, 989, 990, 991, 992, 993, 994, 995, 996, 997, 998, 999, 1000.

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Some Sculpture of the Year .....	Double-Page Ink-Photo.

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### Portland Stone.



ANY years have elapsed since anything original has appeared in regard to the stone raised in the isle of Portland, and as we believe that the material now obtained is but very little understood by architects, in spite of the fact that it is so extensively used, we venture to offer the following remarks, based on a recent detailed examination of the stone both in the quarries and the laboratory. We may seize this opportunity also of giving a brief account of its history, and of some customs peculiar to Portland in connexion with the stone industry, not generally known, and which have had their influence from an architectural standpoint.

#### HISTORY.

A few years ago some remarkable beehive-shaped excavations, believed to have been made in prehistoric times, were discovered in removing the overburden in carries a little to the east of the road from Caes to Easton. They were for the most part dug in rough stone of Purbeck age, but extended also, in some cases, down to the Portlandian series. They were walled by rubble, were from 7 ft. to 8 ft. in height, and about 9 ft. in diameter at the base. The entrance to these underground chambers was by a narrow opening in the middle of each roof, which was covered by flagstones; the floors of the chambers were of the same material. These are probably the earliest examples of the use of Portlandian and Purbeckian stone for building purposes of which we have any knowledge, though it is true the material used is not from the approved building stone beds of the present day.

The Normans used Portland stone in the construction of Bow and Arrow (Rufus) Castle on the east side of the island, the walls, &c., of which, made of Whitbed recently to be described, are in excellent preservation, as we can testify. The old parish church (circa 1475) now in ruins, Wyke Church (also fifteenth century), and Sandsfoot Castle (sixteenth century) were also built of this stone. It was not until the reign of James I., however, that the stone came generally used. A work entitled a "Particular Survey of the Countie of Dorset," written in 1732, by "Mr. Coker, of Dorset," informs us that "Portland hath plentie of

excellent quarries of stone, that for solidnesse and durableness it is transported into London and that in great plentie, sithence it pleased the King (James I.) Anno 1610, by the advice of his Architecturs to make choice of Portland stone for the reedifying of his Banqueting House at Whitehall." Inigo Jones restored a portion of old St. Paul's "casing the outside, and adding a grand Corinthian portico to the west part, all of Portland stone."

Every one knows that the present St. Paul's Cathedral, several of Wren's churches, &c., were built of this material. We learn that in 1665 Charles II. granted 12d. per ton stone duty, 3d. of which was to be paid for the King's use, and 9d. to be retained by the loyal inhabitants who stood by his father. St. George's Church, near Easton, was built of fine-grained Roach, 1764.

According to Professor Hull, Portland stone was largely employed in the city of Dublin, and, in fact, from early times was sent long distances. The columns and portico of the Bank of Ireland (formerly Parliament House), founded in 1729; the Custom House, 1781; General Post-Office, Royal Exchange, and parts of Trinity College, are examples of its use in Ireland.

Apart from the architectural beauty and quality of the material, there can be no doubt that proximity to the sea, and hence cheap water carriage, was an important factor in its extended employment in late Mediaeval times and down to the period of the introduction of railways. Since then, however, although still very actively exploited, it naturally has suffered from the competition of freestones from other parts of the country which were previously comparatively inaccessible and practically unknown.

#### CUSTOMS.

The stony nature of the island undoubtedly impressed itself on the character of the inhabitants in ancient times, as it also materially influenced the styles of their buildings. Even at the present day, when the residence of so many Government officials might be anticipated to have altered all this, we still find vestiges of the ancient life and thought, especially amongst the quarrymen and natives of the high sloping plateau crowning the island. The village streets are broad, and flanked on either side by quaintly-built stone houses, some in ruins; the boundaries between various properties are defined by stone walls, whilst stone quarries are met with on every side; in fact, everything seems to be indissolubly connected with stone. The almost entire absence of trees imparts a barrenness to the whole,

which, if not picturesque, impresses itself very forcibly on the mind of the visitor. The old-fashioned stone-carrying carts, with peculiarly-shaped wooden wheels and still more curious axles, drawn by teams of sixteen horses, are not the least interesting features in this land of desolation.

It is not surprising amidst such surroundings that many ancient customs and privileges yet survive, so little interfered with by modern legislation—especially those relating to the stone quarries. In Saxon times the manor belonged to the Crown, and after many vicissitudes is yet retained by Her Majesty. The inhabitants, at any rate those on the high ground, are almost all freeholders, so that the majority of the quarrymen live in their own houses. The tenure is "gavelkind," whereby the father's lands, at death, are divided equally amongst the sons. Lands and quarries in the island may be sold by what is called "Free Church Gift," which means that any freeholder (or tenant as he is termed by custom) desiring to sell his property, instead of employing a solicitor in the usual way, may dispose of it in church, receiving the purchase-money there in presence of two or more tenants. The transfer is notified by an instrument called "Church Gift," and the act is duly recorded in the parish or manorial register—a simple and inexpensive method of buying and selling, much to be envied.

Tenants, and persons belonging to the parish employed by them, but no other persons, have a right to open and work what quarries they please on the Common land, provided they do not thereby injure the highways, but must pay the customary duty; and all tenants have from time immemorial raised what stone they pleased in their own respective tenements. Those who quarry on Common land have a right, free of duty, to place superfluous rubble, &c., on any of the recognised rubble grounds; but persons working quarries in their private grounds must for this privilege pay a fixed sum per ton on the quantity of wrought stone, the raising of which occasioned the rubble. Tenants may erect piers with cranes for shipping stone on any part of the Common land on payment of a nominal acknowledgment to the lady of the manor, as for an encroachment, and on notifying the quantities of stone shipped from time to time. Any person clearing away overburden on Common land with a view to quarrying the stone beneath, and not, within two months thereafter, opening and regularly working the quarry; or omitting at any time thereafter for the space of two months to fairly work such quarry; or excavating stone



underneath and without first removing the overburden; or opening any such quarry nearer in advance or ahead of any other quarry previously in work than 300 ft., is deemed guilty of irregular and promiscuous working and wasting of stone, and must suffer certain pains and penalties accordingly. From this we see that the method of getting stone by mining is not recognised in Portland. Where in working quarries in either private or parish lands in the cliffs a public road would be destroyed, or worked through if the work were continued, it is the custom for the proprietor of the adjoining land to allow an equally convenient roadway through such land on receiving the tonnage dues for the stone raised under the road. And there are many other interesting customs as to the method of quarrying, &c., to which, however, we need not allude.

#### THE "ISLAND."

In reality Portland is not an island, but a promontory, though everyone alludes to it in the former sense. It is joined to the mainland by the Chesil Beach, a remarkable accumulation of rolled pebbles, flanking which are the road into Weymouth and the line of railway. The sketch map (fig. 1) gives a few topographical details, sufficient to enable the reader unacquainted with the district to

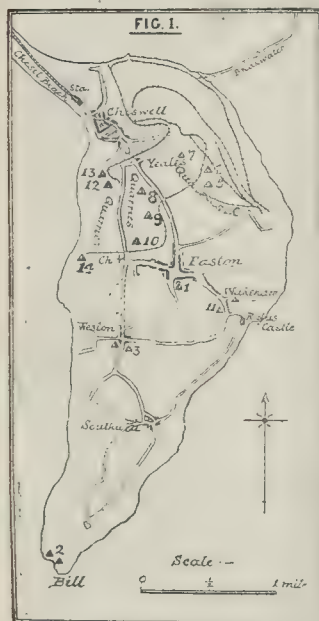


FIG. 1.—Topographical Map of the Isle of Portland.

follow our description of the quarries, the sites of which are also shown on the sketch. The geology of the island has been adverted to on a former occasion in our columns (*ante*, p. 294), so that we need now only remind our readers that but three solid formations—the Purbeckian, Portlandian and Kimmeridgian—occur therein. The section (fig. 2) from north to south shows

the general disposition of these. As will be gathered, the Purbeck beds are very thin, and are removed where they exist, in the process of quarrying. They consist for the most part of rubble and tile-like pieces of stone, together with clay, &c. The uppermost part of the Portland series is also taken away as overburden, the good stone not being reached until some few feet thickness of this are penetrated.

#### BEDS AND JOINTS.

The marketable stone is, broadly speaking, of three kinds, as described in detail in our Student's Column not long since (*ante*, p. 294). They are, in descending order—the Roach, Whitbed, and Basebed. The Roach is joined to the Whitbed, there being no bedding plane between. The former is full of small holes and cavities caused by the removal, chemically, of certain of its fossils, which structure passes insensibly into the Whitbed, where the material is solid throughout, but contains much shelly matter. This latter, however, decreases towards the base, and is practically non-existent in the Basebed, except as very minute fragments only seen by aid of the microscope. The Whitbed may easily be distinguished from the Basebed by reason of its coarser texture and light brownish tint, the Basebed being white. In some parts of the island, beds are duplicated, or the Basebed is not worked, as will presently be shown.

The general micro-structure of the various stones was described and illustrated (*ante*, p. 295), and need not be further referred to.

Speaking broadly in regard to joints, it may be said that for such a thickness of stone, bedding planes are far apart, but vertical joints are in some quarries in the island very close together—only a foot or two from each other. For this reason it is in such localities difficult to obtain wide blocks, though they are thick enough on the bed. The wholesome rule that building stone should always be placed on its "natural bed" in erecting an edifice is, naturally, rebelled against by some of the stone merchants in the island. Indeed, we imagine that in many cases this rule could not possibly be adhered to in regard to Portland stone, where very large blocks were required—specifications to the contrary notwithstanding. In this particular instance we are of opinion that the keeping or breaking of this elementary precept is not a matter of much moment. For Portland stone is not laminated in the true sense of the term like some other oolites and most sandstones; it is difficult even to see the direction of bedding in a block, though the mason can usually determine the "breaking way" when handling the material. If the blocks are, therefore, occasionally built "end on," very little if any harm would ensue—at least in the better qualities of the stone.

The vertical joints are usually mere cracks, but here and there widen out into "bars," lined with calcite or aragonite and displaying small stalactites and stalagmites to perfection. In most quarrying districts the larger joints are filled with ferruginous earth which discolours and depreciates the quality of the stone in their immediate vicinity; but, in Portland we did not discover that the material was in any way affected in this manner, and we paid special attention to the point. The larger joints traverse the beds in a direction from N.E. to S.W.

#### METHOD OF QUARRYING.

As previously remarked, all the quarries are exploited in the open. They are

worked along a face, and odd blocks and rubble are either thrown behind as the face advances, or are thrown over the edge of the precipitous cliffs, considerably disfiguring them as seen from the sea on the west side of the island. The accompanying reproduction of a photograph (fig. 3) illustrates the general method of quarrying. In this instance a large quantity of the overburden has been removed, and the men are standing on the workable stone which is about to be taken out along the excavated ditch. There seems to be but very little attempt to restore the surface of the ground worked over, and, when once the soil is broken for stone getting, it is, therefore, lost—perhaps for ever. No one could walk from Yeales towards St. George's church without being struck by the wanton waste of land, the appalling desolation produced by this greedy method of quarrying. No excuse, on whatever grounds, is admissible for the creation of such a wilderness.

There are no steam cranes in any of the quarries; and the present method of employing hand cranes, held in position by large baulks of timber, or iron rods, is possibly the most economical that could be devised, seeing that the beds of stone are not thick, a circumstance necessitating frequent shifting of these appliances. The capping and overburden are generally removed by blasting with dynamite and powder; but the building stone is never raised by this means, as it would be shattered too much. Portland stone is not sawn *in situ*, but the blocks are detached by cutting channels, or "rifts"—the operation being known as "cutting a drift," or "reaming"—and by the subsequent use of "scales" and wedges.

Each quarry is worked by a "company," or gang of four or five men, and about 525 men are altogether engaged in quarrying; in addition, there are about 75 masons, &c., making a total of 600 hands employed in the Portland stone industry. Masons, and men working in saw-mills are paid by the hour; but quarrymen and quarry-labourers are paid piece-work by the ton, not per foot as in some other stone districts.

#### QUARRYING TOOLS.

In addition to the usual complement of jemmies, bars, hammers, &c., there are certain tools used in quarrying in the island which are sufficiently peculiar to warrant a short description. Three of these are selected for illustration (fig. 4). The kevil

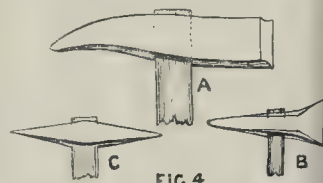


FIG. 4.—Portland Stone Quarrying Tools.  
A = Kevil. B = Stone Axe. C = Twabill.

(pronounced "kivil") is a tool with a rather blunt point at one end, and two vertical cutting edges, one on either side of a hollow, at the other. It varies in size, large kevil weighing as much as 20 lbs. It is used for rough dressing or "pitching"; the pointed end for detaching superfluous pieces, and the cutting edges for subsequently shaping blocks. As a rule, the smaller kevil has sharper points. The stone axe (B) differs from that used in other districts visited. It has a point at one end, and a vertical cutting edge at the other. This modification was probably brought about by the circumstance that the kevil does most of the actual stone hewing. The twabill (pronounced "twybill") is a kind of pick with a point at each end; it is used for channelling, &c. "Scales" are thin flat pieces of steel or iron, placed one on either side of a wedge in splitting stone asunder. The tools belong to the men.

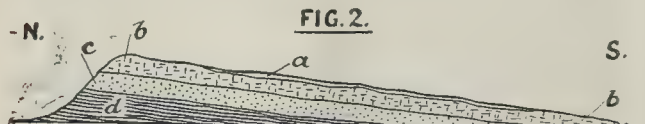


FIG. 2.—Geological Section through Portland.

a = Purbeckian. b = Portland stone. c = Portland sand. d = Kimmeridgian.

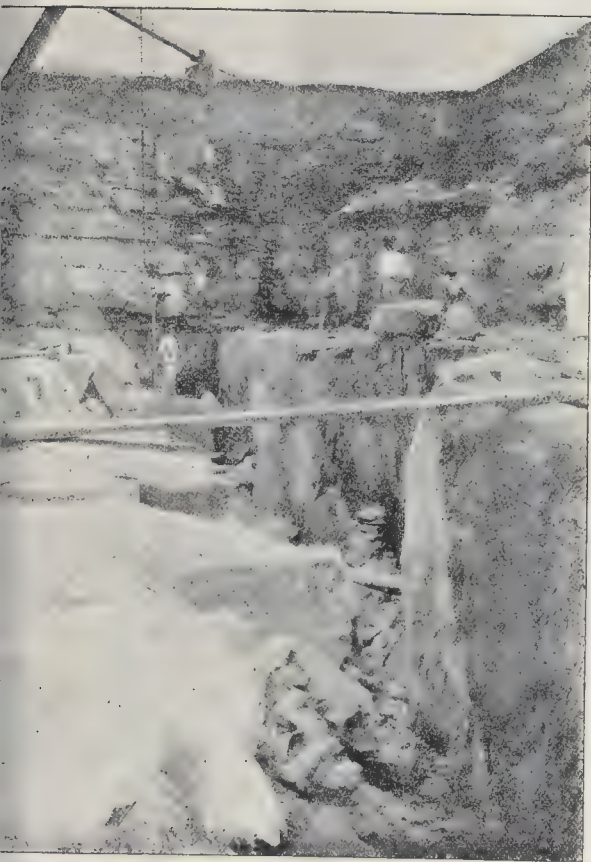


FIG. 3.—Method of Quarrying the Stone.

CARRIAGE.  
t horse-tramways are used in the  
y of the quarries for moving blocks  
ace to place. Indeed, in the northern  
the island a regular network of per-  
gines are also employed to carry the  
and there is quite a depot for them at  
am-sawing and masonry works near  
ll railway station. The use of massive  
th large teams of horses, in stone-draw-  
already been referred to. A railway  
der construction for years on the high  
plateau, but is now in a very dilapi-  
condition. The stone is sent away  
e island (1) by rail from Chiswell  
nd station; (2) by road, running  
with the Chesil Beach, into Wey-  
and (3) by ship from the piers.\*

#### NOTES.

E publish on another page a  
correspondence between some  
architects who were competitors  
for the Harris Technical School  
ton and the Secretary to the Harris  
e, which deserves attention. The  
ts signing the letter state that it  
condition of the competition that  
ole cost of the buildings was not  
ed 8,500*l.*, and that the Council have  
d a design which is to cost 13,000*l.*;  
ther, that it was stated by a member  
Council that the design in question  
be cut down even to come within the  
13,000*l.* They inquire whether the  
in question is to be carried out

according to the plans sent in, or whether  
they include any greater extent of build-  
ing than the 8,500*l.* was stipulated to  
provide for; pointing out with perfect  
truth that if a design has been selected  
which is materially beyond the stipulated  
cost, those competitors who have kept within  
that cost have suffered a grave injustice. It  
might be supposed that the Council would  
be desirous, in consideration of their own  
reputation for fair dealing, at least to explain  
the misconception, if there is any. But they  
give merely a *non possumus* answer; they  
are "unwilling to enter into any controversy"  
on the subject, and state that a competent  
and independent assessor selected the plan  
as the best and most suitable, and that no  
competitor has any reason to complain.  
Now there may of course be another side to  
the matter, but if the Council of the Harris  
Institute think that their reply is one  
which can or ought to satisfy the other  
competitors or the architectural pro-  
fession, they are much mistaken. If  
the facts are as stated, the assessor has  
not done his duty. It is one of the first  
duties of an assessor in a competition, and  
one of the very objects with which an  
assessor is appointed, to see that the  
advertised conditions of the competition are  
strictly complied with. This procedure of  
advertising a competition with a defined  
limit of cost, and then selecting a design  
which is materially beyond that limit, is of  
constant occurrence, and it amounts to a  
flagrant breach of faith with the competitors.  
A further explanation is required, and we  
call upon the Council of the Harris Institute,  
or their assessor in the competition, to give  
one. A charge such as is made in the letter

of the four competing architects is not to be  
disposed of in that lighthearted manner.

A LETTER by "A Capitalist," in the  
*Times* of Thursday, deserves the  
serious attention of those labour leaders who  
are paralysing the trade of England by  
demanding rates of wages at which, if things  
go on as they are going, it will very soon be  
impossible for any one to expend capital in  
manufactures with any chance of a return.  
The writer states that his particular trade is  
extending in all parts of the world, and  
everywhere except in England is yielding  
from 10 to 30 per cent. of profit. He can  
only see a settled determination on the part  
of the workmen to extract every penny of  
profit from him, and on the part of the  
Government to make him pay every year a  
larger proportion of taxation. The conse-  
quence is that while during the first twenty  
years of his experience the returns were  
sufficient to provide for renewal and gradual  
extension of plant, during the last ten  
years each year has produced diminished  
results, until there is now no profit at all.  
Under these circumstances, says "Capitalist,"  
"I am quietly working out my plant, and I  
know many others who are doing likewise.  
... Capital must have its remuneration,  
and if I am correct in my views that it does  
not now receive any return, whether em-  
ployed in agriculture or in manufacturing  
industries, the time is not far distant when  
the army of our unemployed will be counted  
by its millions, and our industries will be lost  
never to return. Government and trade  
unions seem to be conspiring who can first  
drive capital out of the country." But we  
fear it is hopeless to expect that those who  
are urging this country in the direction of in-  
dustrial ruin will see the sense of this, until  
they are taught by the severe logic of  
circumstances.

THE result of last season's excavations on  
the site of the ancient Roman city of  
Silchester, near Mortimer, Hants, have been  
exhibited at the rooms of the Society of  
Antiquaries at Burlington House. To quote  
the report, the work consisted of "the examina-  
tion of (1) the remainder of the large *insula*  
vii. south of the *forum* and *basilica*, con-  
taining the round temple which was partly  
excavated in 1892; and (2) of the double  
*insula* viii. which extends southwards from  
*insula* vii. to the city wall. Also (3) the  
excavation of the northern half of a new  
*insula* ix. west of *insula* i. and north of  
*insula* ii., and (4) of that part of the city in  
the angle by the east gate." The chief result  
of these excavations has been the discovery  
of two buildings, one (of which a large-  
scale model has been made by Mr. G. E.  
Fox) a house of the "courtyard" type—  
as distinct from the "corridor" type—in an  
unusually perfect state, with another house  
of the "corridor" type adjoining, and  
foundations of other buildings; and a large  
building, thought, from its position near the  
baths and the south gate of the city, and  
also from the arrangement of its rooms, to  
have been an inn or hospitium for travellers.  
There are three large hypocausts in this  
building, which is built round three sides of  
a court-yard, and rivals the *forum* and  
*basilica* in size. To the east is the drain  
from the baths, with a sluice-gate in the city  
wall. Several other objects of interest have  
been discovered—Samian and other pottery  
fibulae of various shapes, two—in the form  
of a fish and a shoe—being especially  
noticeable, the latter retaining an inlay of  
enamel; a piece of a border of a mosaic  
floor in grey, white, red, and black tesserae,  
and a number of architectural fragments  
in stone, chiefly capitals of plain character,  
and moulded bases. One of these latter,  
circular in shape, is thought to have belonged  
to the circular or polygonal temple in *insula*  
vii. A stele or monumental stone with an  
inscription in Ogham characters was also  
found, and several portions of tiles with the  
imprint of birds' claws and animals' feet,

\* To be concluded in our next.



while one fragment bears a portion of an inscription. The excavations are to be resumed this year, and it is much to be hoped that the planning of the whole city may not be left incomplete through lack of funds to carry on the work. It is by far the most interesting and valuable contribution to our knowledge of the planning of Romano-British cities that we have had for many years.

WE are glad to be able at last to give some definite particulars as to the pre-historic city laid bare by the drainage of Lake Copais. According to Herr Noach's report in the last issue of the Athenian "Mittheilungen" (xix., 1.) the remains in question lie in the north-east quarter of the lake, opposite Topolia. They are uniform in character, clearly of Mycenaean date, and not, as was at first supposed, belonging to several successive periods. The ruins go locally by the name of G a or Gulks. The strongest side of the massive fortifications is that looking south. The system of fortifications includes four gates, one to the south-east being double. According to Herr Noach the whole plan is only intelligible on the supposition that there was some system of draining and flooding the site. It is intimately connected with the whole system of the Mycenaean dykes and dams, and the newly-discovered city is the key to this system on the north-east as Orchomenos is on the west. The two seem to have been connected and strengthened by a system of smaller forts round the northern bank of the lake, and these from the vase fragments found are clearly shown to be of Mycenaean date. Two such forts stand on small peninsulas near the Katawothre Varii, and a third lies on the summit of the Pyrgos of Hagia Marina, and thus defended the point where the several channels meet in one main canal. The system provided for keeping open the communication between the two principal places, Gulks and Orchomenos, and the sea. We have to picture Larymua as the chief harbour of the Minyans, although so far only vases of proto-Corinthian date have been actually found there. Finally a comparison of literary accounts with the existing topography, as disclosed by the drainage, seem to point to the conclusion that in the ruins of Gulks we have the pre-Bæotian Arne, the royal city of Athamas and his descendants.

DR. KEKULÉ has just published and dedicated to Professor Brunn a remarkable monograph on what he calls "a female draped statue from the studio of the pediment figures of the Parthenon." The monograph is remarkable not for its title (which is all but untranslatable), but because it is a salient instance of what yet remains to be done in the way of identification and classification of supposed Græco-Roman statues in Italian and other museums. The statue in question came into the possession of the Berlin Museum in 1892; it was bought from a dealer who got it from the Villa Brazzà ai Fornaci, near Dolo, between Venice and Padua, and according to tradition it came to Venice in Morosini's time. This, added to the fact that it is of Pentelic marble, might have naturally aroused attention, but so disguised was it by conventional restorations that till now it has escaped attention. Stripped of these restorations, as it is in the phototype reproductions, it would catch the eye even of the elementary student, who would date it as Pheidias. Into the details of Dr. Kekulé's argument we cannot enter, we can note only the chief point. The left foot is substantially raised and rests in the restoration on a modern tortoise; for this Dr. Kekulé substitutes a goose, a somewhat surprising substitution to the modern mind. But the goose was the bird of Aphrodite, and in the figure we have, if Dr. Kekulé be right, a Pheidias Aphrodite, unhappily headless.

MR. POYNTER'S "Israel in Egypt," now on view at the Guildhall Loan Collection, has during the past week or so formed the subject of an attack in our contemporary the *Standard*. Dr. C. S. Du Riche Preller commences by stating that the number of Hebrew slaves harnessed to the ten-wheeled wooden cart whereon is placed a colossal sphinx, is totally inadequate to move the enormous weight. By assuming that the sphinx is intended to be made of granite or syenite, he estimates its weight, together with that of the cart, at 100 tons, and about 1,000 men would be required to draw this weight along, whereas only about 150 to 200 men are employed, apparently, in the pictorial representation. He submits that "even in a picture there should be some relation between two such elementary factors as the weight of the load and the power required to move it. But it is evident that this discrepancy has only been brought to the fore by Dr. Preller to afford him some excuse for altogether undermining the subject of the picture. He is well acquainted with the method of quarrying and moving the gigantic blocks of marble in the Carrara district where bullocks are employed to do the work, and he thinks it most likely that the ancient Egyptians in hauling their colossal statues, or the blocks composing their monuments, utilised bullocks also, instead of men as shown by Mr. Poynter. Another writer, "Student," attacks this view and explains that the artist in representing men as doing the work has followed the very best authorities possible, namely, the ancient Egyptians themselves. But "Student" was not very happy in his illustrations which drew forth a rather scathing reply from Mr. Preller, and it is quite clear that the latter is still under the impression that bullocks were employed, and not men. We may point out, however, that at El Bersheh, in the well-known tomb of Tahutihotepe, there are paintings of a colossal statue on a sledge being drawn by 172 men, arranged in four rows of forty-three men in each row, whilst a foreman is pouring oil on the sledge to make it run easily. So that whether bullocks were or were not occasionally employed for the purpose indicated is entirely beside the point; it is certain that men were so utilised, and Mr. Poynter was therefore quite justified in his representation. In regard to other points raised by Dr. Preller, we presume if they are to be adopted, the painter of imaginative pictures of the future will have to be guided, not so much by artistic effect, as by mathematical problems and engineering considerations of foot pounds!

IN a "Note" on July 30, 1887, we described the then condition of the crypt beneath St. John's Church, Clerkenwell.\* The Chancellor of London, at a sitting of the Consistory Court on the 11th inst., agreed to issue a faculty for removing the human remains of 325 bodies from the crypt to Woking. The Medical Officer of Health for Clerkenwell, and Dr. Hoffman on behalf of the Home Office, are agreed that upon sanitary grounds the transfer ought to be effected. And bearing in mind some unseemly scenes that occurred, yet through no fault of the authorities in charge, when the crypt was opened to the public for a while a few years ago, and it was thought that coffins and bones could be seen through an aperture in a wall built along the north aisle, we think this measure is a desirable one. The crypt should be cleared, and its proportions made visible in their entirety. The present church was built in 1723 by Bishop Gibson, of London, on the site of the choir of the Hospitallers' church, of which Hollar drew two views. It has lately undergone an extensive repair, both within and without, under the directions of Mr. John Oldrid Scott, F.S.A., architect. Mr. Harry Hems, of Exeter, executed the panel, in wood, for the west door, bearing sculptured

figures of St. John the Evangelist, St. John the Baptist, and St. John the Almoner, Knights' patron and tutelary saint.

THERE appears to be a good deal of architectural work in progress in the immediate prospect at Hamburg. There to be another large block of law, erected at a cost of about 25,000*l.*; a municipal hospital of the Eppendorf, with some six to seven hundred beds; the long-mooted new Central Railway Station, costing at least 600,000*l.* Of these, in hand, the most important is, of course, the new Town Hall, which is nearing its completion. It was generally thought this block would look very different on its limited site next to the change, but now the scaffolding is down, the effect is far more satisfactory than was anticipated. The headquarters of the extended Customs Department of the city is nearing its completion, and the new place is practically finished. The new slaughterhouse, which cost the Municipality 200,000*l.*, has been opened, and the new crematorium is now being used.

THE *Vereinigung Berliner Architekten* has just issued invitations to the Congress for "Protestant Church Architecture." The work "Protestant Church Architecture from the Reformation up to the Present Time" was issued by the Society last year in preparation for the congress which holds its first sitting on the 24th or 25th of the new church on the Gensdarmenmarkt. There will also be an exhibition of designs for Protestant churches.

A REUTER'S telegram from Athens (dated Sunday) announces fresh discoveries at Delphi. Fresh sculptures to light day by day. The most important of these is a frieze said to be from one of the numerous Treasuries, and it is conjectured that dedicated by the Siphnians. The portion discovered is 17 mètres in length, and represents a procession of horsemen, chariots, seated gods and goddesses, and a gigantic machine. The analogy of a portion of the subject to that of the Parthenon frieze will lend it special interest. Moreover, it is reported to be a very fine specimen of Attic work. A small pediment of the style has also been found, and contains representation of the essentially Delphic subject of the contest between Herakles and Apollo for the tripod. A number of early reliefs are also reported of porous marble, and interest from their primitive style as well as their subject. Pausanias (x., 11., 2) how the island of Siphnos had mines, and the god wisely bade the inhabitants send tithes to Delphi. They built a Treasury in niggardly fashion after a time for the tithe, and the god sent the sea to swallow their mines. He unfortunately took no account of the sculptures that decorated the Treasury.

WE wish some of our friends who write us such things as descriptions of buildings illustrated, &c., would endeavour to write "English as spoken," or as written according to ordinary literary rules, and not what we call "specification English." The essential characteristic of this latter form of writing, which too many architects indulge in, consists in the omission of the personal pronoun "the." This is all very well in specifications, which are a kind of summary or schedule of work to be done, but it is the most objectionable effect in a journal, ought to be written throughout in plain literary style, and we never will admit writing into our columns. But to avoid this often have to fill in the word "the" twenty, thirty, or fifty times in an architect's MS. in the proof when it comes before us; and object to this waste of our own and printers' time in turning "specific English" into literary English.

\* See also the *Builder* of October 7, 1854, and July 1, 1870, with illustrations.



## ARCHITECTURE AT THE ROYAL ACADEMY.—II.

Having noticed in our first article some of the most prominent and important drawings in the Architectural Room, we may now proceed to, in the order of hanging, such of them as are of any special remark, commencing with the first drawing in the room, the perspective of the "Scheme for covering in the Roman Bath, at Bath" (1,512), by Messrs. Baggallay & Bristowe. The drawing shows a large massive square pilasters carried up to the bases *in situ*, supporting an entablature around the pilasters (or rather, square columns), with a statue above each, the room covered, over this, with a coffered barrel-vault. Between the square columns the space is divided into two heights by an entablature with columns over it. The general effect of the drawing is fine and monumental in character, completely suitable as the covering to the Roman bath. With this we may take 1,519 and 1,520, exterior and interior elevations to the pump-room buildings, Bath, the perspective views illustrating Mr. N's successful design submitted in that too celebrated competition. The exterior well executed pen-drawing, the plan and section of which we have already published. The building, with its dome and apse, groups well externally, and is quite in keeping with the architectural character of the bath by the works of Wood. The perspective shows the room under the dome; the dome being carried on coffered ribs rising from an entablature and an order, with an apse and semi-dome at each end, the order continued round; at the end the spectator the wall below the semi-dome entablature is flat, the columns which the entablature standing out from it. The drawing is somewhat roughly executed, but the effect of the whole is fine and dignified.

At the end of the drawing is a plan of the whole, which is a geometrical drawing of a large plan, of a kind of which we wish we were more in the Architectural Room. A scale plan and elevation show the house as before the additions. As will be seen on looking to our last number, the old house was a parallelogram cut in two lengths by a central hall, and with external flights of steps from the yard and from the garden in the rear. Outside staircase in front has been transferred to the interior, and on its site a lower hall and a large porch have been built. The garden remains as they were, but the circular drawing-room bay to which they formerly led up is replaced by a square termination forming garden front of the hall. As far as we can see the effect of the garden front from the (for no elevation is shown), we should regret the removal of such a feature as this semi-circular bay, which might, we should have thought, have been retained as a semi-circular added porch. The principal staircase is placed where a bedroom and a small stairly stood, and the longitudinal corridor is cut through the old walls and connects the drawing-room and dining-room, placed at opposite end of it, and separated from it by ante-chambers. The effect of this vista through two ante-rooms and two lengths of corridor, and across the central hall in the drawing, ought to be very fine and effective, but it is a pretty long one (nearly 15 ft.), and requires a very large company to appear at its length. The drawing-room and dining-room are placed with their principal length at angles to the corridor, and the building continued back in two wings, that behind the dining-room including smoking-room and billiard-room, and that behind the drawing-room a plant-house, gallery, and terrace. As an expansion of an old and cramped place into a new one of symmetrical and palatial character, this is an admirable example of planning, and might well have been hung lower so that the effect of the plan might have been studied, but cannot be done as it hangs; our own eyes upon it are based on the lithograph in the pages. Architecturally the centre of the drawing, which is one of the plain frigid Classic forms of the earlier part of the century, is left as was, and the side additions are necessarily keeping with it: but the plan is worth notice.

New buildings, Norfolk-street" (1,522), by

Mr. John Dunn, is a fair specimen of new business buildings, but we cannot see the architectural propriety of diversifying a street front by hanging pilasters, as it were, on the upper part of the wall, which are projected on corbels and have no foundation in the lower portion of the structure. It is a misuse of an architectural feature. The same architect's "Premises in Arundel-street" (1,540) are much superior to these, and the pilasters here have pedestals to carry them; of course, as the ground floor in this case is not shops but offices, the difficulty of treating the front architecturally is not so great. This is a respectable piece of street architecture, and a certain breadth is given to it by the grouping of the three upper stories of windows under large elliptical wall arches.

The "Small House at Brentwood" (1,525) by Mr. E. A. Hill, is a couple of elevations and a small plan, which is noticeable for the elegant way in which the circular porch is introduced, half in and half out of the wall. The porch is treated in a semi-Classic manner, and decorated with the little colonnettes on the upper part of its wall. The plan, which is L-shaped, is a well treated one for a small plan, and the elevations are picturesque and characteristic.

"Proposed Church at Portsmouth for the Winchester College Mission" (1,526), by Mr. Joseph H. Ball, is an interior view in monochrome water-colour, with a heavy but effective tie-beam roof treated in a decorative manner. The columns and arcade are of a Romanesque proportion, but with Classic capitals. The walls show a large amount of decoration in figure subjects and ornament; we do not gather how these are intended to be executed, whether in painting, sgraffito, or other methods, but the general effect in the drawing is good, and the church, if carried out as shown, promises to be of some interest.

"Garden Front of a House at Enfield" (1,527), by Mr. T. W. Cutler, has a certain special character from the employment of the three low half-timbered gables in a row, with semi-octagon bays below the two end ones, and a solidly built round-arched doorway in the centre.

The drawing of the "Marble Staircase at the Glasgow Municipal Buildings" (1,532), by Mr. W. Young, is a striking water-colour drawing and shows the effect well, but the architectural effect seems to reside more in the richness of the materials than in any special quality of design.

"Municipal Buildings, Rotherham" (1,533), by Mr. R. J. Lovell. The angle portion of this building, which is L-shaped, is effectively treated, and gives the "municipal" character to a comparatively small building of its class. The side portions are rather deficient in character and originality.

"Village Club and two Residences at Warnham, Sussex" (1,535), by Messrs. Batterbury and Huxley, is a very pleasant bit of modern village architecture in black and white half-timbered work, the houses and club on opposite sides of the road, which forms the centre of the picture. Small plans are appended (without scales by the way), to which the only objection we have to make is that (in the club plan), if the smoking-room is desired to confine the smoke within its own limits, it should not have had two doors, one of them directly opposite the reading-room door.

"Billiard-room, Blawith, Grange-over-Sands" (1,536), by Messrs. Willink & Thicknesse, shows part of the decoration of a room in the house which was shown in a drawing in last year's Academy, and of which we published an illustration. It is a richly and effectively designed room, in a style rather more Classic in feeling than the exterior of the house would lead one to expect, but it is an effective room both in general aspect and detail, especially in the treatment of the angle nook and fireplace, the latter with a heavy semi-circular projecting mantelpiece decorated with carving. The scroll brackets under this do not look quite powerful enough for the weighty character of the mantelpiece.

"A Summer Cottage for the Undercliff, Isle of Wight" (1,537), by Mr. Victor T. Jones, is a good characteristic little plan, spread out into large circular turrets at the angles, which however should have been distinct in treatment, as one of them is a bay out of the drawing-room, the other is a staircase. In other respects the plan is well arranged, and the small house has a distinct character of its own.

The "New Conservative Clubhouse at Glasgow" (1,539), by Mr. R. W. Edis, accords with its name, for it is very conservative in style and treatment. A certain local character is given

to it by the introduction of corbelled-out turrets after the Scottish manner.

"The New College-street, Gloucester" (1,543), by Mr. F. W. Waller, is an effective view of a new street of houses or shops near the cathedral. The drawing is executed in sepia in a rather loaded manner, which suggests rather than shows the detail, and, as far as we can judge, the treatment is not one we feel very much sympathy with; but with the cathedral rising behind, and the south porch seen facing the end of the street, the whole makes a pleasing architectural picture.

Messrs. Kidner & Berry's "Stables and Entrance-lodge, Bisham-on-Thames" (1,546) is a good specimen of the picturesque treatment of stables in a simple manner, with a low wall and high-pitched roofs. There is no plan.

"Welburn Hall, Kirby Moor Side" (1,548), by Messrs. Demaine & Brierley, seems to have taken its inspiration from an old Jacobean-house or is it in part an actual old house added to? There is nothing to show. There are mullioned windows with a small order of Classic columns alternating with them; the same order is continued round in a quadrant as a passage to an out-building on the left of the picture, apparently a summer-house. It is an attractive and pleasing bit of building of its kind.

"The New Public Offices and Technical Institute, Leyland" (1,549) by Mr. Tulloch, is a perspective (without plan) of a building of free Classic tendencies but with rather curious detail, which seems too manifestly prompted by the desire to be original; heavy arcivolts with hood-moulds which curl up at the end, springing from large pieces of cornice balanced on small pilasters. The author has done much better things than this, and we would rather he returned to his old manner.

"The New Nave and Tower of St. Peter's, Bushey Heath" (1,541), by Mr. James Neale, has no plan, but is apparently a nave with narrow side-aisles for passage only, and the buttresses carried over the aisle. Wall-arches in the clear-story spring from the gables of these buttresses, beneath which are circular clear-story windows with geometric tracery. The tower (south-west) is rather peculiar on plan, being a parallelogram longer in the east and west direction than in the north and south, and with a heavy lantern story with a steep roof over it. The whole is rather heavy in appearance, but otherwise is a somewhat original and effective building.

## THE ARCHITECTURAL ASSOCIATION:

PRACTICAL HINTS ON THE WORKING OF WROUGHT-IRON.

AN ordinary meeting of the members of this Association was held on the 11th inst., in the meeting-room of the Royal Institute of British Architects, Mr. E. W. Mountford (President) in the chair.

The following gentlemen were elected members of the Association, viz., Messrs. R. Anson, N. M. Doncaster, E. H. Rouse, A. B. Venables, W. J. Walford, and F. C. Young.

Votes of thanks were passed to Mr. Fellowes Prynne for allowing the members to visit All Saints' Church, West Dulwich, on April 28; to Mr. J. L. Pearson for allowing the members to inspect the new church at Maids-head, on the 5th inst.; and to Mr. W. D. Caroe for conducting the party over the church.

Votes of thanks were likewise accorded to Mr. Earle, Mr. E. Howley Sim, and others, for the entertainment at the members' soirée on the 4th inst.

It was announced that the annual dinner would take place at the Holborn Restaurant on the 31st inst.

Mr. Goldsmith (Hon. Sec.) read the House List, as already published in the *Builder* for May 5, page 343.

A letter was read by the President from the Committee of the Discussion Section, nominating Messrs. A. B. Pite and F. G. F. Hooper as Vice-Presidents, in addition to Messrs. A. C. B. Booth and A. W. Earle already nominated.

The following gentlemen were elected as scrutineers for the ballot, viz., Messrs. C. H. Brodie, E. W. M. Wonnacott, E. Greenop, and H. M. Wakley.

Mr. Henry Longden then read the following paper, entitled "Practical Remarks on the Working of Wrought-iron," with examples:—

Wrought-iron is one of the most useful and necessary materials which the needs of man have discovered. It has been used from early ages, and its widespread use is easily explained from its strength in proportion to its bulk and its cheapness. It has been used for railings, screens, balconies,



balustrades, chains, anchors, cramps, stanchions, chests, all kinds of supports, implements for use about fires, hinges, locks, window-fastenings, and numberless other uses which would be tedious to recapitulate.

The material, too, is one which has to be worked with heat in all genuine smith's work, and it requires strength of arm, sureness of eye, dexterity of hand, and great judgment. A little over-heating in the fire, a little over-hammering, and the metal is spoiled, and the work has to be done over again. There is something fine, strong, and masculine about good iron-work, and each curve, swell, or play of line in a piece of forged work has to be got by good hard blows which the finished work expresses to the mind, although the observer may not know what effort has gone to produce the result he sees.

The iron is now bought from the manufacturers in bars or rods, and, in this material especially, quality is of great moment, as iron work in connexion with architecture has usually some office to perform in which strength and lightness are both sought for; the quality of the iron should be looked to, as inferior iron has neither the strength nor the power of resisting the destructive effect of the atmosphere which good iron has. There is a point, too, which causes much difference between old and modern work, in the regularity of the making of the iron bars or rods. In old times these were drawn out on the anvil from lumps of iron, and now they are rolled between what are called "rolls" of iron with grooves turned in them. The hot metal is made to pass through the rapidly-revolving "rolls," and a bar 12 ft. long will be quite of the same section and size from end to end, whereas the bar made by the old process would be irregular in thickness, which, in certain kinds of work, adds charm to the design. I have found it necessary in some work to heat and hammer the bars to give them some of the irregularity of surface of the old work.

Before beginning his work the smith takes his bar of iron and examines it, springs it by shaking it, and tests it generally as to soundness and quality. For bars in railing the iron has to be looked along to see that it is out of twist and straight. The smith then heats the bar in the fire and brings it to the anvil, on which he may work it alone, or with a "striker" or "drummer," or with more than one if the work is heavy. The smith directs the "strickers" with his hammer, which is a lighter one, how and where they are to strike with their heavier hammers, and he can indicate the force of the blow he wants. The working together of two or more men on the glowing mass of iron drawn from the fire, the perfect understanding without words which they show, and the shaping from the bright red mass of the object to be made, passing through cherry red to dull red, and finally to a grey blue, is one of the pleasantest things I know to witness. The tractability of the material and the way in which a fine and delicate object can be made out of a rough mass, with almost no waste of material, is a great lesson in the superiority of mind over matter. I know of no material which exemplifies this, in a large way, so well as iron.

If a bar or rod is to be used in railing, with a head, a thicker piece is welded on to the bar, and it is drawn down with the hammer to a taper shape or to any other shape that is required by the design. Where the heads are drawn smaller and there is great repetition, a "swage" or "stamp" is made, which makes them more readily and makes them all alike, which is the more economical but less artistic way of doing the work. In St. Helen's Church, Bishopsgate, after the numerous changes and sweeping away of monuments, there are some good examples of this kind of work, notably round the tomb of William Kerwin, where very light iron, only  $\frac{1}{2}$  in. square, set angleway, is made into a close railing, the heads are of various lengths, and the forged collars and finishing knobs at different distances in the heads, yet the effect is good and free. Sir Julius Addiman's tomb-railing, of which I made notes in 1890, appears to have gone. This was a stronger railing, still very close, and with fine twisted corner pillars, made of four  $\frac{1}{2}$ -in. square bars twisted together, with square moulded caps and bases, and long twisted pinnacles finishing with balls.

The mode of making the rails, or the long horizontal bars for railing, varies much, and the effect to be got by these is worth consideration in designing railing. The simplest and cheapest way is to take the ordinary flat bar and punch out the holes by machinery. This is almost of necessity the plan used for large quantities of railing, on account of cost, and the holes punched may be

square or round. When the work is smaller, as in internal grilles or small gates, the effect of swelling out the rails with round swells to suit round bars, or with swells for square bars, set either square-way or angle-way, is richer. The perspective, in which we really always see this kind of work, is much enriched by the breaks in the horizontal lines, and the extra cost caused by swelling out the rails is found to be well bestowed in greater elegance of effect. The rails used in this way need not be so large, as, when straight flat bars are used, the width of the iron must be enough to allow of the holes being punched without danger of bursting out the iron on each side of the hole. . . .

The effect of square upright bars set square-way or angle-way is also worth considering in designing railing and grilles. The perspective in which one sees them has the effect of making the square-way square bars look the richest, as you get the two sides wherever you see the railing. When the square bars are set angle-way you may see practically only one side, and the effect is poorer, though the diagonal projections in the rails make a kind of decoration. The round bars have a pleasant softness of light and shade, but where strength of effect is wanted square bars are to be preferred.

For gates strength in the frame-work and staying with horizontal lines is essential. In the way of treatment of the iron, the grain or the lamination of the metal in the length-way of the iron must not be forgotten. The bracket-piece I have here, which forms the end of a horizontal bar of a gate, with its tenon prepared to rivet into the mortice to be cut into an upright bar, looks a simple and straightforward piece of work, but it has taken a good deal of making. It is first made with a hole through it, the tenon is then rivetted into it, the way of the grain being the length-way of the tenon, and then the remainder of the shoulder and the rail to form the horizontal bar is welded to this piece of work. I have known instances of smiths attempting to cut the tenon out of the solid lump, and so shaking the iron in the process that the grain was destroyed and the tenon fell off. If this does not happen the iron is weakened and that which should be one of the strongest parts of a gate, having to resist twisting, thrusting, and sagging, is not able to do its work adequately, and the gates will give way much sooner than they would if well made. . . . I may here say that hammer-made, as contrasted with filed-up wrought-iron work, should always be sought for and required. This remark applies to black work; where the iron work is polished, which is a very beautiful treatment for small and very rich work, the whole surface has to be filed and finished up with emery.

The treatment of iron in forming scrolls is one of the characteristic ways of working this metal, and one to which no other metal or substance with which I am acquainted will lend itself. The iron is taken of an agreed size, and is heated and drawn out, thinned, either spread in the thinning or kept to the same width throughout, and then rolled up entirely by the eye and the skill of the hand. There are steel templates made, round which these scrolls can be turned, but the result is, as might be expected, a dead uniformity and a loss of all life in the work. There are here examples of three ways of forming scrolls, of which each has merit. The more the iron is drawn out the closer it may be rolled up to look well.

These scrolls often spring from stems which are prepared with short starting-pieces, and the scroll is welded to the starting-piece, care having to be taken to make the welding places at such distances from one another that they are not too often heated in the fire during the weldings. The end of this stem is shown "scarfed," so that a bar can be welded to it without a diminution of bulk at the point of welding. The two bars to be welded are brought to a white-heat in the forge, are then laid together on the anvil, are brought by gentle blows of the hammer into their right places, and are then, by strong blows, firmly united, so that a good weld makes, of the two pieces of iron, one. This quality of the power, without any other substance being employed as solder, of making the two things indissolubly one, is a special quality of iron. The preparation for welding the scroll is done similarly to the piece with the leaf in the centre.

The forming of the forged leaves is an interesting part of the work. A blank is first made, which is well hammered. It is then hammered into a V-section. It is then worked

further, serrated, the eyes cut, and modelled with the hammer, until you find a well-modelled leaf. This is a special branch of the work, the fine, bold modelling requires much skill and practice. In much of the work done, both older and more recent times, the leaf was hammered out of thin sheet, and is then finished with "checks" filed out of the main lines of work, so that the thickness of the leaf shall break the suavity of the line. The leaf is rivetted on, and often brazed too, but that is the best smith's way of doing work, and is enduring, as the thinner iron is sooner destroyed by rust.

There is here another piece of work, which the bar is drawn down and twisted, the top, and two leaves, forming a sheath, welded on it. You can just see where the thickness of the leaves melts into the stem, and just this amount of variation in the line of life and vivacity to the work.

I do not follow out this part of the work, as fine beaten work in iron, black or polished, which can be done would lead me rather far from smith's work, which is pre-eminently wrought-iron work.

Another treatment of iron is carving it. This work lends itself well to grotesques. If carried out in the Renaissance times with delicacy and beauty, but while it will add interest to small works, it is too difficult to be doing, except in a small way, in a material which is so intractable, which is only another way saying unsuitable, for the purpose.

The small quatrefoil is an example of welding first of each trefoil point with the two branches springing out of it, and then of bending the branches and welding them together in the centre of the lobe of the quatrefoil. This work has to be done very accurately when these quatrefoils have to be banded together to make sheets of work, but may be done so that each quatrefoil has its individuality of its own, and that the mechanical uniformity which is the blight of much modern work may be avoided.

There are intricacies of halving bars together by which is meant filing out of each of two meeting one another mortices, so that when one with the other, the two bars take up only room of one, but this weakens the iron much and is not to be recommended. It is principally done in work where a flat surface is desired and in later times.

Twisting iron is another characteristic treatment. It is to be remembered that a twisted square takes more room when twisted than when plain it cannot, therefore, be passed through the which would take the plain bar; but it is possible to reduce the bar to be twisted as to make very little if at all larger than the plain bar. Twisting is done in large sizes of iron this reduces before twisting must be done, otherwise the work looks coarse. Twists of 2, 3, and even 4 strands may be done, and in some of the late Mediaeval work a good effect was got by grooving the bar and then twisting it. There is a good example of this in the Ante-Chapel of St. John's College, Cambridge. Round rods of small size can be welded together and twisted—indeed, a small rod of this, swelled out in the centre, has become commonplace in the shops, and is, as always such cases, greatly misapplied. I have seen it used as short pillars in a fender, while the reason for it is either that it is wanted to relieve what would otherwise be a dull length of bar as a termination, like a handle. It is one of the small clevernesses which are easily overdone.

The setting out of ironwork for staircases where there are curves and ramps is difficult, a running pattern, rather than one which sets in panels or smaller repeated parts, is to be avoided. The difficulty can be overcome, but the result does not seem to be worth the trouble required to attain it.

Mr. Longden then referred to some examples of old and modern work as exemplifications of points he had named.

A grave cross, a piece of Swiss work probably of the seventeenth century, showing welding and scroll-work, split at the ends, moulded and spread out into ram's horns in a manner very characteristic, he said, of late German and Swiss work. It was too florid in style, but was a masterpiece in its way.

An oblong panel, also a piece of Swiss work, was noticeable for the fine design of its main lines, and for the way in which the iron is beaten thinner from the main thickness, is formed into leaves, then goes on again as flat iron in reduced form, and finally finishes in a leaf and sharp point. The thistle suggestion was here very plain, but the thistle was nowhere so used as



is naturalistic; it always keeps within the limits of ornament. . . . The panel of Mr. Sedding's work was excellent, which was made purposely with irregularity in the scrolls and in the ornaments. "The only binding points in this," said the lecturer, "are the points of contact of the scrolls, and a general unity of shape in the scrolls is kept, but after the smith was left quite free to form the scrolls to his fancy. Looked at in the full-face it looks very irregular; but, if you were to take the work forming a side-screen to a chancel, or one of our best late architects had had the side-screen made in an admirable manner of regular Medieval design, you would see the life was in the iron-work."

The panel with two large roses is a piece of Sedding's work for Holy Trinity Church, Epsom. It is an epitome of that work, and he said was the best iron work he had seen. In its abundance of line, in its profusion of ornament, and yet in the subordination of the ornament to the principal parts, it is a good example of Sedding's work. The screens at the side of the chancel steps are of plain bars with a carefully curved and ramped capping; and up the centre of this comes a free undulating stem, rises above everything and bursts out into a leaf and blossom, as one has seen a bunch of roses rising up out of a hedge. Only a master craftsman could do such daring things, but I lifted myself by his work. . . .

Which iron work is being done now, more than has been done for many years past, and there is a revival of the pretty and meaningless work. I went to see at an exhibition promoted by the Smiths' Company lately very little work I should consider really smiths' work. Fire-irons, lamp brackets, and other small things, the staple of the exhibition, and florid, needless ornament was abundant. It may be that in a room it is difficult to show the best pieces of work, but in only one or two did I see any indication of feeling for the work, by which I do not mean thin iron, but into intricate forms, but work formed in a manner I have before described. This work lends itself to making combinations of leaves, flowers, &c., of stock sizes, and we are offered flowers, leaves, bosses, and other things wholesale. I need scarcely say here is not the way to good work, and that the work of old times, which we study and admire, which we found our own work, without copying, of course, was not done in this

is a great fashion in these matters. I remember when Gothic hinges, often of very fine handles and certain screens in cathedrals were the only iron work made. Now I am saying that the making of hinges is less in demand than it was. In the making of a hinge clasped both the front and back of a door, the knuckle thrown out to suit the pin, is fixed in the stone-work, and the iron front of the door well drawn out and down and hammered into ornamental form, one of the best tests I know of a good smith. There are still fine screens made, but the cheap and the ordinary use of iron-work has increased that no skilled man should want to make them.

Architects will require good work they can understand and the understanding of the points of ornament is much greater than it was some years since."

Arthur Keen, in proposing a vote of thanks to Mr. Longden for his paper, said, in talking to me after the day, he was told that the work for wrought-iron was rapidly getting away, and that people were getting tired of it. He thought that perhaps that was so with the ordinary shop article, and it would be well; but they might rest assured that the use of iron-work was well made, and, if properly designed, people would not easily get tired of it. Mr. Longden's paper was very interesting, because it was a description of all the methods of doing work, and was exceedingly valuable for them, as architects, to know how the work was done—whether brick-work, wood-work, or metal-work; and what they desired was to find out the methods of doing it. They had often to keep their work very simple, and they must get what effect they could out of natural applications of the methods of work. In looking at old work, and bosses, and domestic work especially, and finding its charm lay in its being done in a perfectly natural way, with no ostentation or

strain about it; and if they did the work in the same spirit, he believed the same effect would be obtained. Builders must often have considerable difficulty in doing the architects' work now-a-days, because it was frequently designed in a wrong manner; while, if the work was designed in the right spirit, the effect could be obtained at half the cost, and was really much more pleasing. On the chateau of Amboise there was a balcony with a wrought-iron front, which was most simple and effective, and he ventured to say it would not cost half as much as many modern balconies which were not nearly so effective.

Mr. W. H. White seconded the vote of thanks, and agreed with the last speaker, that it was to methods of work they should look for help in designing. He would like to call attention to the old work in the squares of the West End and the West Central district of London, which was rapidly disappearing. With regard to iron-work generally, he believed, if the old examples were studied more, there would not be so much meretricious work seen nowadays. He had been very much struck in Essex with the old signs and little bits of wrought-iron work, and a sketch-book could be soon filled with many charming specimens.

Mr. E. Greenop said, in listening to Mr. Longden's paper, there occurred to him the beautiful examples to be found in the South Kensington Museum. As to the work which was hammered cold, and of which Mr. Longden had spoken disparagingly, he believed it had got to such a low ebb that it had been adopted by young ladies as a sort of drawing-room accomplishment. At the same time, it occurred to him, looking at Mr. Sedding's beautiful panel which he saw before them, that some of the leaf-work had been done in the cold state, and possibly even pined. It might be want of taste on his part, but, with all the admiration he had for Mr. Sedding, he must say that the old Swiss panel exhibited pleased him more than his elaborate design.

Mr. H. A. Satchell endorsed what had been said about the advantage of having practical papers read before the Association. He hoped that Mr. Longden in his reply would be able to indicate to them briefly the way in which they could get effect at little cost. He would also like Mr. Longden to give them the results of his experiments in the protection of wrought-iron, for it was a pity to see so much of the modern work perishing, especially where it joined stone bases.

Mr. H. W. Pratt remarked that he was glad to hear a condemnation of elaboration in wrought-iron work, the tendency now being to over-elaborate. A reference had been made by one of the speakers to signs, but a great many of these seemed to be overdone. At the same time, he spoke with some diffidence, as many of these signs had been designed by eminent architects. One felt that the work put into these signs must be thrown away to a great extent, they being so much above the eye, besides getting choked up with dust. If a little more attention were only paid to simple forms, and an endeavour made, in designing the iron-work, to keep before them leading lines, and a scale of size in the metal, the result would be much more satisfactory. One got a little tired of seeing scroll-work all in the same relation one to another, the same sized bar being used over and over again, for in this way it was impossible to get sufficient relief to mark the design, and to give it character. With regard to iron railings, there was room for a good deal more treatment in the way the upright bars were finished; and if they would only adopt the simple methods shown them that evening, the result would be very much more effective and attractive to them as architects, even if it was not to the public. There was no doubt that the largest amount of metal-work now done was in connexion with domestic, rather than with church work, notices excepting screens in churches. He had noticed also that the elaborate work, in the way of hinges on church doors, had, within the last few years, very much diminished. He supposed it was caused by a sort of reaction, the method having been a little overdone, and it having been imitated to some extent in cast-iron work. At the same time, it would be a pity to permit a legitimate method of design to drop out. It was a method of design and detail which came close to one's eye, and one was able to appreciate the work, while it was a very effective treatment for a doorway.

The President remarked that, in hearing a paper like that by Mr. Longden, it was impossible to add much to what had been said, but he had hoped that more questions would have been asked. Mr. Longden's paper was the sort they were always endeavouring to get; they did not care so

much for the historical aspect of things, as to know how things were done. In looking at cheap work, one saw at a glance that it was "cheap and nasty," and the imitation of wrought-iron work which builders were so fond of doing in cast-iron, was particularly abominable. He agreed with what Mr. Greenop had said, for, much as he admired Mr. Sedding's work, he could not help feeling that in the panel shown that night, he had carried the use of iron beyond its proper limits. The material had its limits, and when one tried to reproduce, as Mr. Sedding had done, the actual forms and growth of leaves and flowers, it seemed to be going outside the proper use of the material, and suggested a German rather than an English origin. It was a useful thing to be told, as they had been that evening, about iron bars, because that was the sort of railing that most of them dealt in. He had had a good deal of it done the other day, and was much annoyed to find the bars flaking, so much so that he picked pieces half an inch square off the edges of the bars. In fact, he told the makers that he did not believe it was wrought-iron, and having condemned it, he found out afterwards that these bars were made by the mile at Birmingham. He could not agree with what Mr. Longden had said as to the superiority of square bars in perspective over angle bars. Whenever he was doing that sort of thing, he always put them angleways; it was infinitely prettier, and had the advantage of making the bars look bigger, so that the client, when paying for 1-in. bars, thought he was getting 1½-in. bars. Then, again, the resistance of an angle-bar would be greater than that of the same bar set square, and when one was reduced to having to calculate the strength of the bars, this was an advantage. The question of the preservation of iron was a matter of great importance, and he would like to ask Mr. Longden if he had heard anything of a process produced some years ago for enamelling wrought-iron? No doubt everyone had noticed the way in which wrought-iron bars were eaten away close to stonework, and he had always understood it was caused by the chemical action set up by the contact of the lead and the iron. This might be overcome by using sulphur for the setting of the bars. Another important question was as to how thick the bars should be made. In the case of architectural scroll work, and things of that sort, it was especially difficult to know how thick to make the scroll work, when it was to be placed about 50 or 100 ft. from the ground. Much of the modern wrought-iron work looked too fine when at any height from the ground, and the same mistake was constantly made, even by the best men, in the case of such things as church screens. He had, in fact, seen screens, designed by architects of eminence, whom he dare not name, where the metal-work was so fine, that one hardly realised the screen was there, and there appeared to be no object in having it in that position at all. The old men did not do such kind of work, and even the later Renaissance work was more solid than anything we had in these days.

The vote of thanks was then put and cordially received.

Mr. Longden, in replying, said: As to the swelling of the bars on the balcony at Amboise, it was a beautiful way of getting a simple style of decoration. By swelling out the bars and making the swelling change in the two directions, an excellent effect could be obtained and an enrichment of the surface was thus got by the simplest means. With respect to the old iron-work about London, a great deal of it was extremely beautiful and valuable, notably in such places as Grosvenor, Hanover, and Berkeley-squares, and in the Bloomsbury district. As to the skill of the workmen, if they got a good plain smith and knew how to tell him what was wanted, there was no doubt he would do it. At the South Kensington Museum there was a most valuable and wonderful collection, but the gallery over the court was nearly always dark, so that the objects were seen with difficulty, and then nearly always in silhouette. With regard to the specimen of Mr. Sedding's work, he was not quite unbiased. It had been found fault with for being too florid, but there was no "fudging" about it, and, speaking with all deference to the judgment of the gentlemen present, he considered it a beautiful piece of design. Swelling the rails in a small piece of work cost little more, though if carried out in a large piece it would cost a good deal more. The best thing for the protection of iron work was to soak it, while it was "black" hot, in oil, at the forge, and then paint it well. He had never heard of anything which could take the place of



good oil-paint for protecting iron work. The enamelling process he did not know of, but anything of that nature suggested a glazed surface, and that to any extent, in the case of iron, would not be agreeable. Galvanizing was, no doubt, a protection, but if it began to scale it would come off, and he believed, after all, that plain honest oil-paint was the very best thing to use. Reference had been made to iron decaying where it was set into a stone base, and he knew the case of a railing where strong bars were made of wrought-iron and lighter ones of cast-iron, the whole being let into a stone coping. The result was that in about eighty or ninety years' time the wrought bars were eaten away, so that they were no thicker at the base than a lead pencil, while the cast-iron bars were just as good as when put in. The explanation was that the bars were let in with lead, which had set up a chemical action and eaten the iron away. If such work was fixed with sulphur or good cement it was the best way of fixing it. There was no doubt that much work was over-elaborated; and the commonplace work to be seen now-a-days without a leading line in it was absolutely loathsome. As to the dying out, to some extent, of the making of hinges, he believed a good deal of that arose from the change in the character of church work. Everybody was aware that, in the fifteenth century hinge-work, practically, went out, and if people built in the later styles hinge-work would naturally disappear. The dreadful cast-iron hinge-fronts, too, had thrown a certain stigma on hinges. A remark had been made as to the flaking of the bars, which must have been used as they were sent out of the rolling-mill. No bar should leave the forge without being hammered over, and properly put through the fire. With regard to the position of the bars, angle-ways or square, he would bow to the President's opinion. In dealing with work which had to be placed 50 ft. from the ground, everything should be twice as big. The size of the works as placed near the ground should be doubled in bulk, and in design, and this would give about the equivalent effect. Though ironwork might be gilded and coloured, it was a great error to gild it all over in most cases. Mr. Sedding liked ironwork of extreme thinness, and sometimes he (the speaker) had found much difficulty in getting what was wanted. He recollected Mr. Sedding wishing a screen made of plain rings banded together, of extremely light iron, but the effect in the church was very beautiful. The proceedings then terminated.

### THE CONGRESS OF HYGIENE.

WE take from the official programme of the Congress of Hygiene, to be held at Budapest, the following list of papers to be read on the subject of the Hygiene of Dwellings:—

#### IX. SECTION.

##### THE HYGIENE OF THE BUILDINGS.

1. *Blarr, A. (Berlin).* Reformbestrebungen auf dem Gebiete der Wohnungswirtschaft.
2. *Compagnon, P. (Paris).* Des plans et devis de quelques idées basées sur l'hygiène pour des édifices publics en général.
3. *Fellner, Ferdinand (Wien).* Feuersicherheit der Theater.
4. *Fischer, H. (München).* Heizung, Ventilation und Beleuchtung der Theater und Stungenräume.
5. *Griffith, Major J. M. (London).* The Hygiene of Prison Cells.
6. *Leyden, E. (Berlin).* Die Spitalsversorgung der tuberculösen Kranken seitens grosser Städte.
7. *Ney Béla (Budapest).* Színházak tüzbiztonsága.
8. *Reul Friedrich (Halle).* Indirekte Beleuchtung in Auditorien.
9. *Révész György (Budapest).* Nagy városokban iskolák, csoportos lakások, kórházak és testnevelési köznevelési iskolák.
10. *Schrotter, J. Ritter v. Kristelli (Wien).* Spitalsversorgung der tuberculösen Kranken seitens grosser Städte.
11. *Ullrich, Hans (München).* Die Wahrung der Reinheit der eingeleiteten Luft und die Assanierung der Luft bei Centralventilation.

#### X. SECTION.

##### THE HYGIENE OF DWELLINGS.

1. *Cachoux, Emile (Paris).* Systeme des maisons de rapport et des maisons de famille, au point de vue des intérêts hygiéniques et financiers.
2. — *L'influence du logement sur la santé des habitants d'une grande ville.*
3. *Corfield, W. H. (London).* Protection of dwelling-houses against sewer-gas. The control of escape of the sewer-gas.
4. *Galton, Douglas (London).* Central heating of dwelling-houses and whole towns.

5. *Gruber, Franz (Wien).* Systeme der Wohnhäuser für die minder bemittelten Classen der Bevölkerung.
6. *Kersch, G. (Linz).* Zweckmässige Ventilation der Privatwohnungen.
7. *Trellat, E. (Paris).* Chauffage central des logements dans les maisons de rapport et dans les villes entières.
8. *Weyl, Th. (Berlin).* Ueber ein neues Feuer-closet.
9. *Zavitziano Sp. (Constantinople).* Les cabinets d'aisance.

The section on the "Hygiene of Towns" is too long for us to quote. The English contributors to the list are Mr. de Courcy Meade, "Practical Ventilation of the Sewers in Towns"; Mr. R. E. Middleton "Technical Results of the Establishment of Drainage Works in Large Towns," and "Technical Results shown by Water Works Established in Large Towns," both papers dealing with the period of the last ten years; and Mr. W. R. Smith, "Effects of Filtration on Drinking Water."

The fee for membership is ten florins for gentlemen and five florins for ladies. The membership ticket, which will be sent to everyone who has paid the fee, will secure certain reductions of railway fares. The Secretary-General, to whom fees are to be forwarded, will give information as to hotels and lodging as far as possible, and members of congress are advised to bespeak hotel-room beforehand. A list of hotels recommended can be obtained from the Secretary.

The following is the list of attractions and entertainments proposed in connexion with the Congress:—

- A) The Corporation of Budapest as the host of the members of the Congress, will arrange for their guests an evening-party in the edifice and gardens of the National Museum, for the purpose of introducing the members to each other.
- B) The Corporation will also arrange a reception-scène in honour of the members, in the halls of the Town-Redoute.
- C) At the Royal Opera House, the National Theatres, and at the People's Theatre, festive representations will be given in honour of the members of the Congress.
- D) September the 6th (Thursday) being reserved for a day of rest, the members will have an opportunity:
  1. to view the public buildings, hospitals, establishments, sanitary institutes, factories, &c.
  2. On this day the members may make excursions:
    - a) to Totis, the seat of Count Nicolas Esterházy, who invites them there.
    - b) or to Balatonred.
    - c) or to Siofok on the Plattensee.
    - d) or to the Heights of Buda.
    - e) or to the Margarethen Island, where the XV. Section—sport, etc.—will arrange a regatta, etc.
  - E) On two evenings the Section of Sports arranges athletic, gymnastic, and cycling competition productions.
  - F) The Corporations and Societies interested in the Congress will also arrange reception soirées in honour of the members.
  - G) On the other evenings the Hungarian Presidents and honorary Presidents will entertain the members.
  - H) After the closing of the Congress the following excursions are contemplated:—
    1. Excursion to Belgrad-Constantinople.
    2. Excursion to Belgrad-Hercules-Bath.
    3. Excursion to Mezőhegyes, the Hungarian State Farm for Horse and Cattle breeding.
    4. Excursion to the High-Tátra, Old and New-Tátrafured and to the Icecave of Dobšina (eventually in connexion with a skating festival).
    5. Excursion to Agram-Fiume-Abazzia.
    6. Excursion to Bosnia and the Herzegovina.
    7. Excursion to Pístjány.

For the reception, conducting, and entertaining of the lady-members of the Congress, a special Committee has been formed, of which Mrs. Polixena Pulszky-Hampel is President. There seems every intention at Budapest to make the Congress a success.

OPENING OF PECKHAM RYE PARK.—On Monday Mr. John Hutton, Chairman of the London County Council, opened Peckham Rye Park, an additional open space adjoining Peckham Rye. The park has an area of 48 acres. The total cost of the site has been 51,000l. Towards this the London County Council has contributed 18,000l., the Charity Commissioners 12,000l., Camberwell Vestry 20,000l., Lambeth Vestry 500l., and St. Mary Newington and St. George the Martyr, Southwark 250l. each.

\* The Secretary-General's office is at "St. Rochus Hospital, Budapest," up to August 20; after that it will be at "The Fylat Joseph Polytechnicum."

### INCORPORATED ASSOCIATION OF MUNICIPAL AND COUNTY ENGINEERS.

A LANCASHIRE and Cheshire district meeting of the members of this Association was held at the Town Hall, Chester, on the 12th inst., J. T. Eays, C.E., of West Bromwich, President of the Association, presiding.

The members on their arrival were received by the Mayor and Deputy Mayor of Chester, extended to them a hearty welcome to the town of Chester; and the President suitably acknowledged the courtesy of the Mayor and Corporation, permitting the Association the use of the Municipal Buildings for the meeting.

The first business was the election of Honorary District Secretary for the district, S. S. Platt, of Rochdale, who has held the position for nine years, retiring upon his election as member of the Council.

The President proposed a hearty vote of thanks to Mr. Platt for his services as district secretary, and paid a very high tribute to the value of his services to the Association.

Mr. T. de Courcy Meade (Hornsey), seconded, remarked that Mr. Platt had been life and soul of the Association in the Lancashire and Cheshire districts.

Mr. Brierley (Newton-in-Makerfield) supplied the vote of thanks, which was accorded with acclamation.

Mr. Platt, in acknowledgment, said that his interest in the work of the Association would be lessened by his retirement from the office of district secretary, and whoever was appointed successor, he should endeavour to give him assistance in the carrying on of the work.

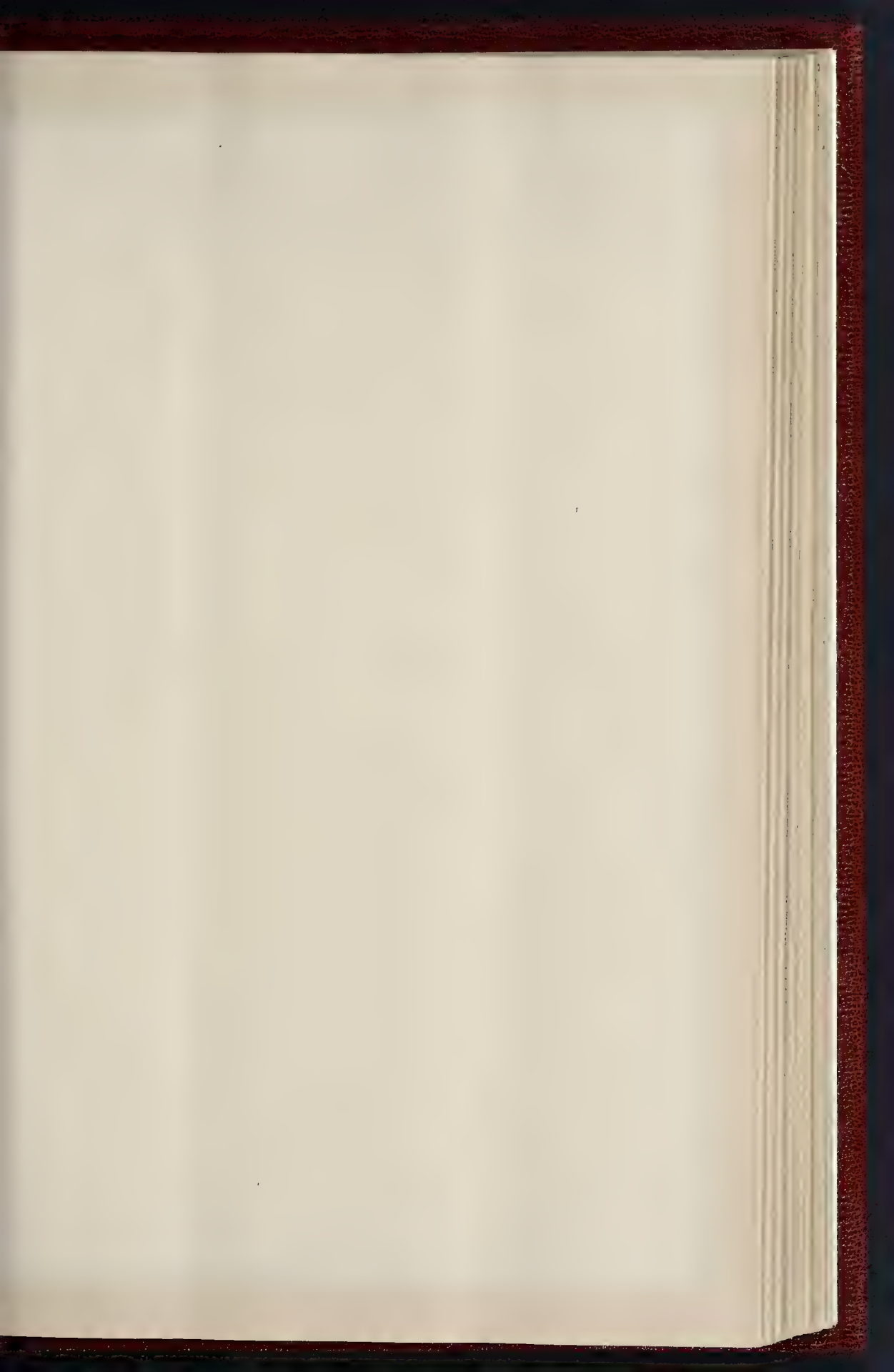
Mr. J. Cartwright (Bury) proposed the election of Mr. Button, of Burnley, as district secretary in succession to Mr. Platt. He remarked that Mr. Button was very well known to the members, they had visited his work, and knew what he was doing. There was not a more enterprising engineer in the North of England or one who was making a greater mark.

Mr. Wellbourn (Middleton) seconded the proposition, believing that in Mr. Button they had a very able and excellent secretary.

The proposition having been adopted, Mr. Button, in acknowledgment, assured the members that it would be his earnest endeavour to carry out the duties to their satisfaction, at the same time to help forward the interests of the Association.

Mr. Allan Greenwell, A.M.Inst.C.E., secretary to the Frome Rural Sanitary and Highway Authority, read a paper on "Steam Rolling." He said that the Secretary of the County Surveyors' Society had put the question to County Surveyors, "Have you any further information to offer as to the cost and desirability of rolling by steam or otherwise?" and in a correspondence which appeared in the *Builder* in connexion with the above question, a County Surveyor wrote as follows:—"Steam rolling is not defended on economy of cost. It saves consolidation without abrasion or trituration of the metal." These statements are

illogical on the face, because if the cost of steam road rolling was less than one-eighth of the cost of the metal consolidated, economy of results. Having noted the varying methods which different surveyors calculated the cost of the work upon time, area, or quantity, he there was much to be said for and against the method. The cost per day depended much on the quantity of work performed in the time beyond a certain quantity an increase in the cost caused a relatively much greater consumption of fuel and heavier wear and tear, besides adding the necessary horse hire for hauling water, and the labour for sweeping. Again, the cost was calculated at per 100 super yards, or at per cubic yard of materials consolidated, the quality of the stone, the thickness of the coating, liability to stoppages on account of traffic, and the relative area of the pavement must be taken into consideration. The personal experience the writer had found it more satisfactory to base his calculations on the cost per cubic yard as enabling an accurate check to be kept upon the work actually performed. In the calculations which he made, the following items were included in cost of steam-rolling engine-drivers' wages, sweepers' wages, horse hire for hauling water, landing, coal, oil, waste, and sundries, depreciation and repairs of plant. The experience was all in the Frome district during the last years, and the stones used were blue rock mountain limestone chert; tough blue sandstone (lower oolite), and grey limestone (lower oo-

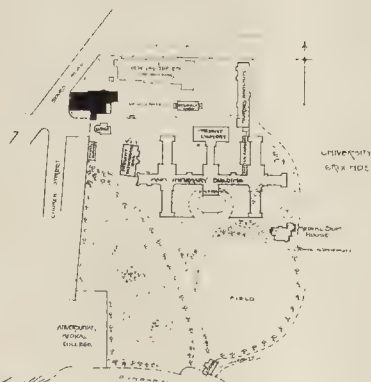




THE  
PROPOSED PATHOLOGICAL  
WESTERN INFIRMARY  
GLASGOW.



# BUILDINGS ARY



BLOCK PLAN OF INFIRMARY







very little used. The steam roller, which was by Messrs. Aveling & Porter, weighed 12 tons and rolled a width of 6 ft. 3 in. The account amounted to 2½ per cent. per day. The staff attached to the steam-roller consisted of the driver and two sweepers, one of whom acted as foreman. During the financial year 1893-4, 52 hours per week = 2,808 hours, the roller worked as follows:—

	Hrs.	Days.	Hours.
work .....	2,158	239	7
working out boiler and .....	400½	45	1½
rolling .....	245½	27	2½
rolling through frost .....	75	8	3
rolling on hire .....	39	4	—
rolling .....	7	—	7
rolling .....	2,928	325	3

During this period 165,329 superficial yards of stone were rolled, and 9,132 cubic yards of stone were rolled, making a daily average of 689 superficial and 38 cubic yards. The stone was as follows:—

	Cubic yards.
Mountain limestone .....	6,869½
Tough blue sandstone .....	1,592½
Flints (chert) .....	689½

Cost was as follows:—

	Rate per cubic yard consolidated.
driver's wages .....	£ s. d.
wages .....	63 6 6
hauling water .....	78 6 4
rolling .....	124 9 0
rolling .....	5 9 0
rolling .....	32 9 0
rolling .....	352 19 10
rolling .....	81 16 3
rolling .....	431 16 1

Observation had led the writer to estimate at least 25 per cent. of the material rolled by steam road-rolling. The cost of road-rolling a patch of mountain limestone stones in thickness, one mile in length, 10 ft. wide, was found to be 36½ ls. 7d. of coating was 189½ ls. 8d., and under circumstances when consolidated by the roller would last seven years, making the net cost per annum 27½ ls. 8d. The net saving from the use of the steam-roller was 10, or 15 per cent.

Mr. Islington in proposing a vote of the author of the paper, said it was a pity that he had not heard a paper read on steam-rollers in rural districts. He was under the impression that there were few rural districts in which steam-rollers were used. It would be quite worth while to compare the cost of steam-rolling in rural districts with town streets, where the steam-roller made the work extremely costly. Streets which could not be closed there would be passing along necessitating stoppages of the roller. He thought that a class of stone used in the Frome district would be more suitable than a road-roller would be more suitable than a road-roller.

Mr. Courcy Meade, said he had had steam-rollers at Hornsey for fourteen years. He had used four rollers—one of 6 tons, two of 10 tons and one 15 tons. His experience of the roller by a 6-ton roller was very different from that experienced by Mr. Smith. The roller did its work admirably, and at the present time would prefer a 6-ton roller for rolling one of 10 tons. He feared that the roller in the paper, though very interesting, could not be applied in any way in town streets. He had had a careful watch on his district of the time the roller was at the time it was standing, owing to the roller, and he found that not one of the time was the roller engaged on the

material; that showed how delusive the figures would be when applied to town districts.

The President, in closing the discussion, agreed that the figures would be very fallacious if compared with the work done in towns. The quantity of stone which could be rolled varied very considerably in almost every town. He found that on the average he could not roll more than 600 yds., not far from Chester, where they only did 200 yds. a day. The cost of his rolling was from a ½d. to 3d. per yd.

The vote of thanks was unanimously accorded. The members then visited Eaton Hall, the residence of the Duke of Westminster, and were permitted to view the mansion, the paddocks, and other places of interest. The arrangements made for the disposal of the sewage at Eaton Hall were inspected, after which

Mr. Albert Wollheim, A.M.Inst.C.E., read a paper on the Eaton and Eccleston Sewage Precipitation Works. He said:—

"The Duke of Westminster's estates near Chester, situated on the banks of the River Dee, are very extensive, and comprise, besides the world-renowned Eaton Hall, the villages of Eccleston, Aldford, &c., and a number of isolated mansions and residences scattered over the estate. There are also several blocks of buildings contributing considerable quantities of sewage, such as the Eaton Laundry and the celebrated Eaton Stud. When I was called in to advise as to the disposal of the sewage on the estate, I found the highly objectionable and dangerous cesspit or overflow cess-tank system in operation, a system which I am sorry to say is still almost universally in vogue at our country mansions and institutions, but the days of which, having regard to the progress of sanitary science, I venture to hope are numbered. I naturally endeavoured at the outset to collect the entire sewage into one common outfall sewer; but it was found that this was not practicable, owing to the contour of the ground and the distances between the various places, which would have entailed an outlay not at all commensurate with the volume of sewage to be dealt with. It was, therefore, decided to proceed with the work in sections. The first section, which has recently been completed, deals with the sewage from the Hall, as well as with the laundry washings; the second section, which will be commenced shortly, will deal with the sewage from the village of Eccleston and surrounding properties; whilst the remaining habitations, farm-sheds, &c., will deal with their sewage separately.

The Eaton Precipitation Station consists of accumulation tanks, mixing channel, precipitation tanks, and the building containing three rooms, one for the engine, another for the mixers for preparing the chemicals, and a third is used as a chemical store. By utilising sideling ground, I have been enabled to select a site which is an exceptionally favourable one, for not only does the sewage gravitate to the accumulation tanks, but it also gravitates from these to the mixing channel and precipitation tanks; moreover, the effluent as well as the sludge gravitate from the precipitation tanks, the former into a channel leading to the River Dee, the latter into air-drying pits close to the site.

The reason for accumulating the sewage in storage tanks, a system which I have adopted in similar installations where a sufficient fall is available, is this:—In small works the cost of labour in attending to the plant forms a very considerable item in the working expenses, and should therefore be kept down to the lowest possible limit. This can be done by accumulating if possible the entire day's sewage in storage tanks. The capacity of each division of the storage tank I adjust to correspond with the capacity of a similar division of the precipitation tank. In this way it is only necessary to discharge the sewage into the precipitation tanks in the morning, adding the chemicals during the discharge. Moreover, the chemicals I prefer to have made up in the mixers ready for discharge, the capacity of each being adjusted to correspond with the quantity of precipitant to be added to any one compartment of the storage tanks. In the present installation each compartment, and, consequently, each mixer, is adjusted by the man in charge to empty in about twenty minutes. Thus the proportioning of the chemicals—a very important matter in my opinion, and a problem presenting some difficulty in gravitation works where the equalising action of sewage pumps is absent and the flow of sewage is subject to sudden variations—becomes a very simple task.

A brief reference to the method of treatment adopted at the Eaton works will, I trust, be acceptable. It is the 'Amines' process, and its

distinguishing characteristic is that it effects complete sterilisation. It is now generally admitted that any scheme of sewage treatment and disposal must aim at effective prevention of all nuisance and danger to health within reasonable limits of cost, and that whatever danger or nuisance is attributable to sewage is caused by the bacteria which it contains. Strides so rapid and discoveries so startling and of such direct bearing on the sewage question have been made in bacteriological science that any sewerage engineer who should ignore the lessons taught by those scientific discoveries would, I hold, commit a serious mistake. For, whether the plan adopted contemplates the treatment of the sewage in tanks or on lands, or both, with or without artificial filtration, the question of the bacteriological effects of the treatment obtrudes itself at every stage. At the tanks it is a question of avoiding putrefactive smell caused by the action of bacteria on the albuminoid organic matter. After artificial filtration, though the risk of putrefaction may have been minimised, the danger from disease germs is not excluded. Both land filtration and broad irrigation are open to objection on sanitary ground, unless all disease germs have been previously destroyed, for otherwise there is risk of contaminating the subsoil water, and as for broad irrigation that has clearly been shown to be capable of spreading disease through the medium of germs deposited on roots and leaves of farm crops.

Now as the 'Amines' process succeeds in destroying every species of germs contained in sewage, it follows as a matter of course that both the effluent and the sludge are non-putrescible, and further, that neither of them can be carriers of disease. I need not enlarge further upon this point, its importance being obvious. I have only to add that the cost of chemicals for the process is one halfpenny per thousand gallons of sewage treated."

On the motion of the President a vote of thanks was accorded to Mr. Wollheim for his paper.

Mr. Alfred M. Fowler, M.Inst.C.E., has been elected President of the Incorporated Association of Municipal and County Engineers. Mr. Fowler was formerly Borough Engineer of Leeds, Salford, and Newcastle-on-Tyne, and for many years has been in private practice in Manchester. He constructed the quay works on the river Tyne, the tramways in Salford at their introduction in this district; the large intercepting sewer for Salford, including the many large bridges in that town, and is now engaged on the outfall sewerage scheme for Stockport.

## Illustrations.

### PATHOLOGICAL INSTITUTE, GLASGOW WESTERN INFIRMARY.

THE illustration is taken from the drawing at present on view in the Royal Academy, for a new Pathological Institute, proposed to be erected at the Glasgow Western Infirmary, for the use of students attending classes there.

The external walls will all be built of local white stone, having an inside lining of 4½ in. brick, with 2½ in. space between, and all interior walls, with the exception of chapel, mortuary, staircase, and corridor walls, will be plastered on solid with Parian Cement.

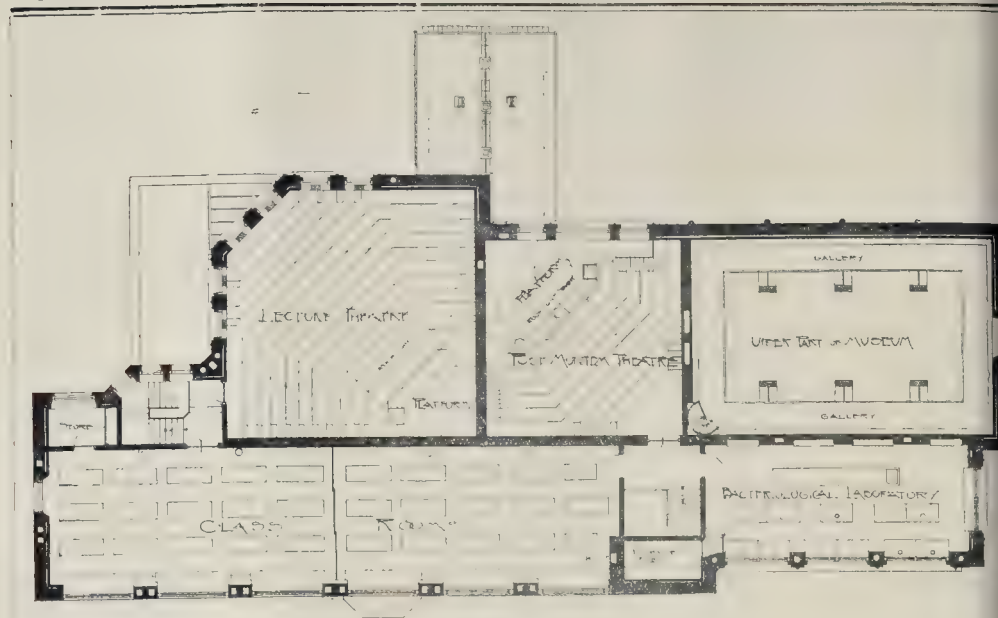
The walls of the chapel and mortuary are to be faced inside with English pressed brick, with stone dressings at windows and doors, and the staircase and corridor walls are to be tiled. The floor of chapel and porch are to be laid with mosaic to design; those of the mortuary and post-mortem theatre platform with asphalt, turned up on walls, and the floors of corridor, staircase, and lavatories with tiles to design.

The chapel and museum are to have open timber roofs, the latter being lighted principally from the roof, and having a double tier of galleries running round walls, supported on cast-iron cantilevers, and reached by an open iron spiral stair in the corner, which will be continued up to allow of an exit to the flat concrete roof over the lecture theatre. The gallery is to be vaulted over with concrete and stone ribs.

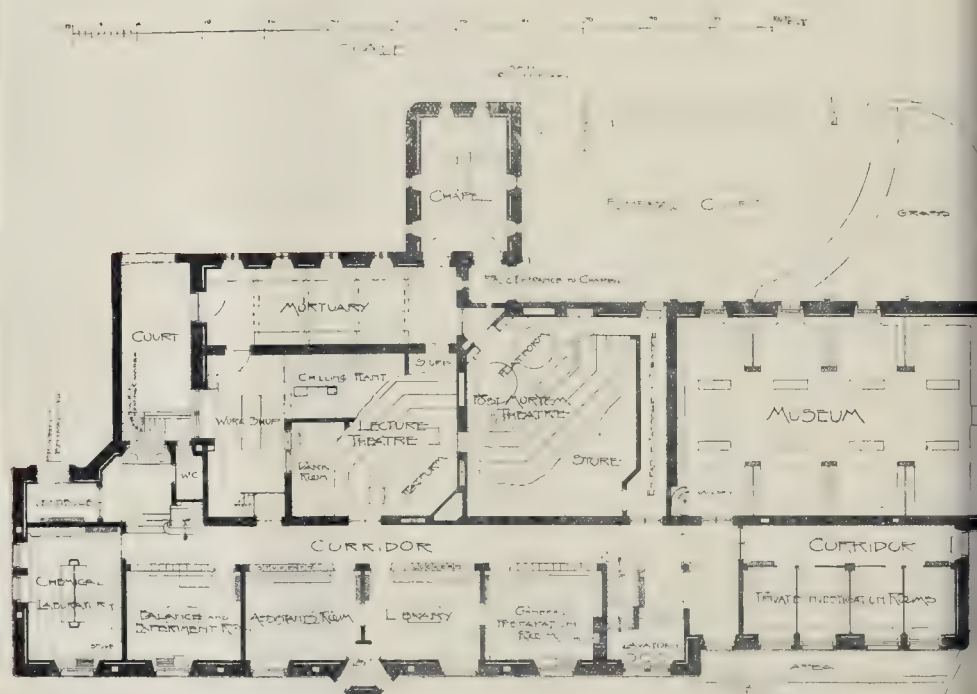
Special attention has been directed to the heating and ventilation; the air will be admitted into air ducts under the ground floor and heated by hot pipes before entering the rooms.

Exhaust shafts will be carried from each apartment into the large fêche in the roof, where a



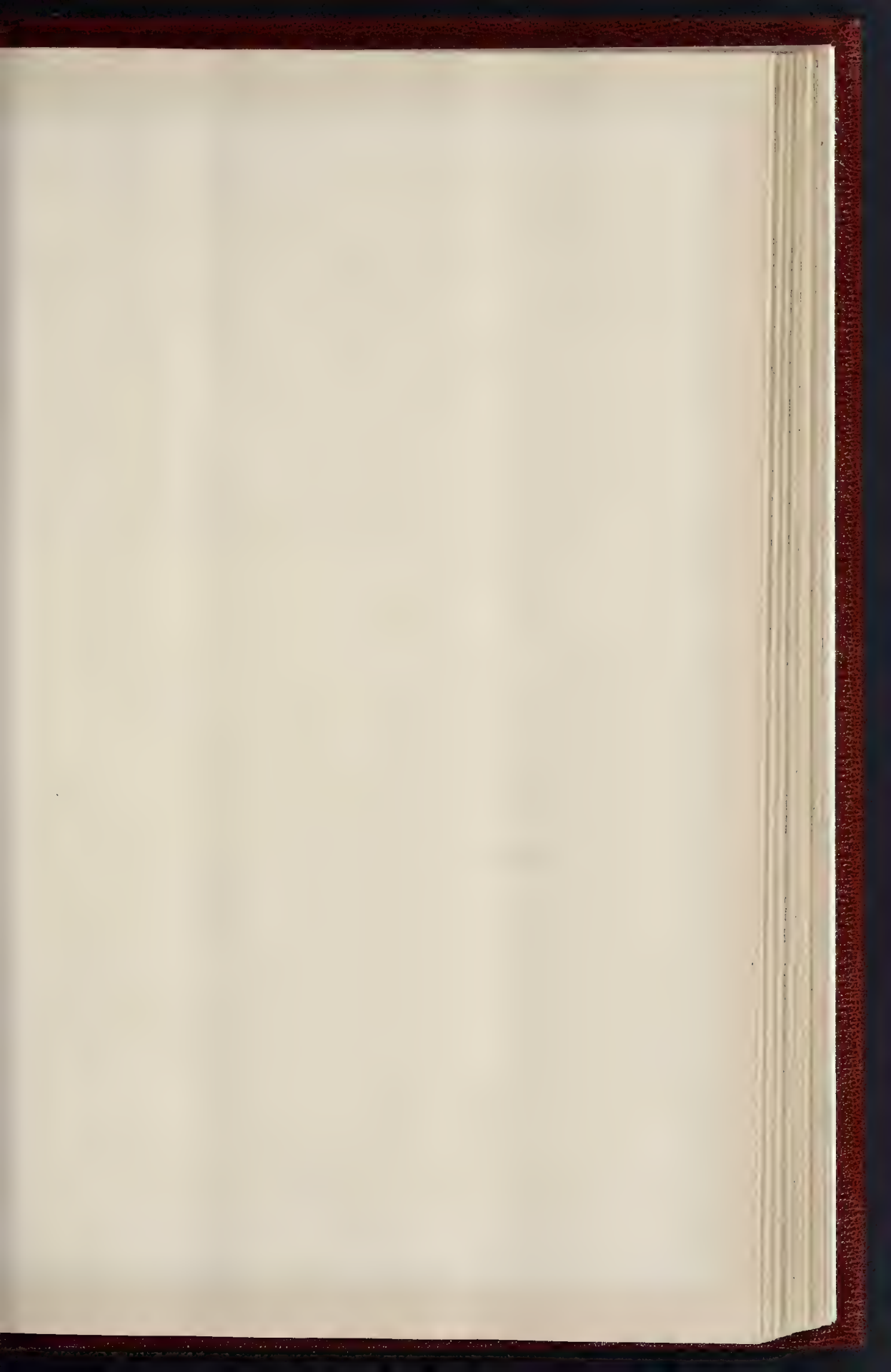


PLAN OF UPPER FLOOR.

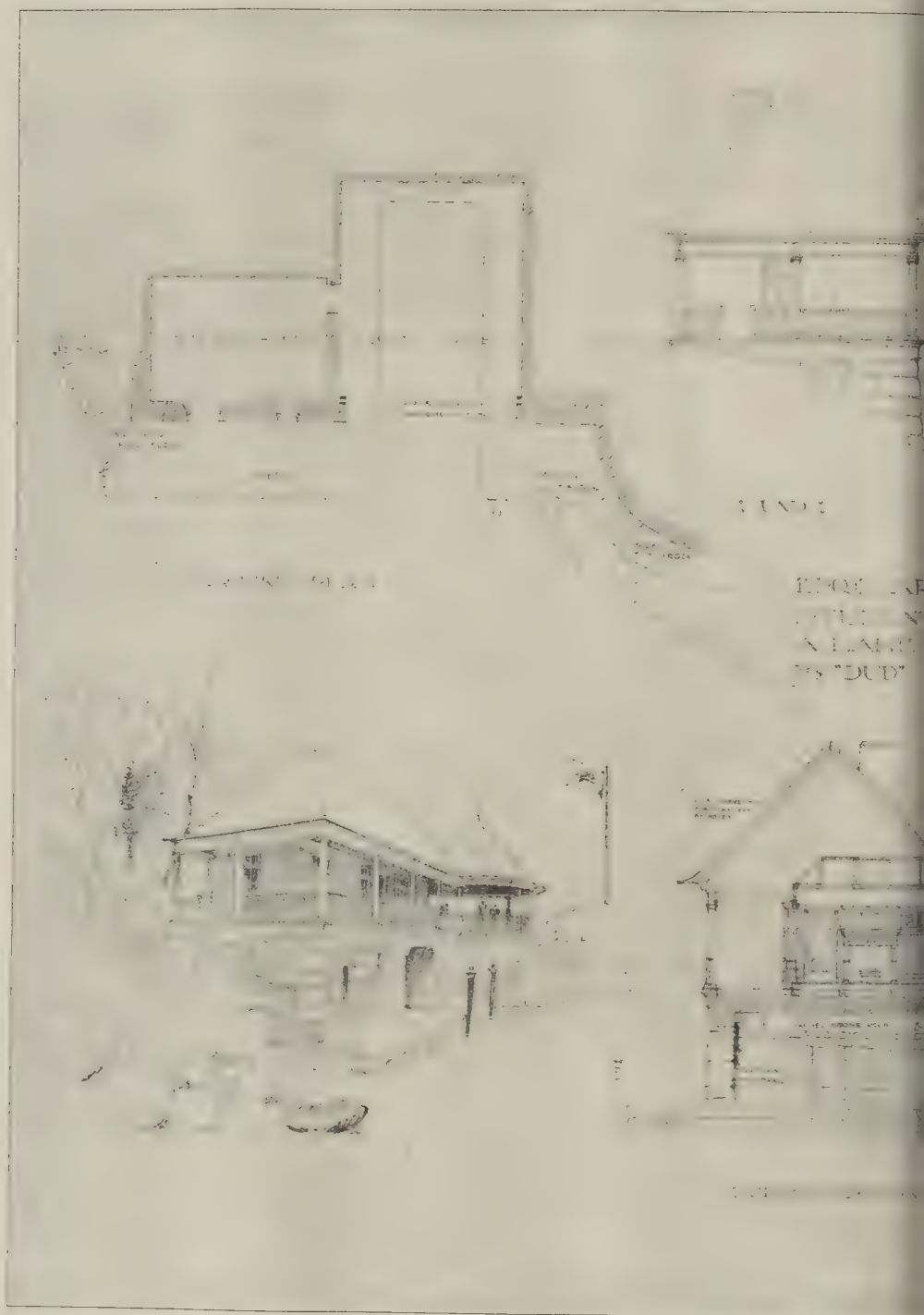


PLAN OF GROUND FLOOR.

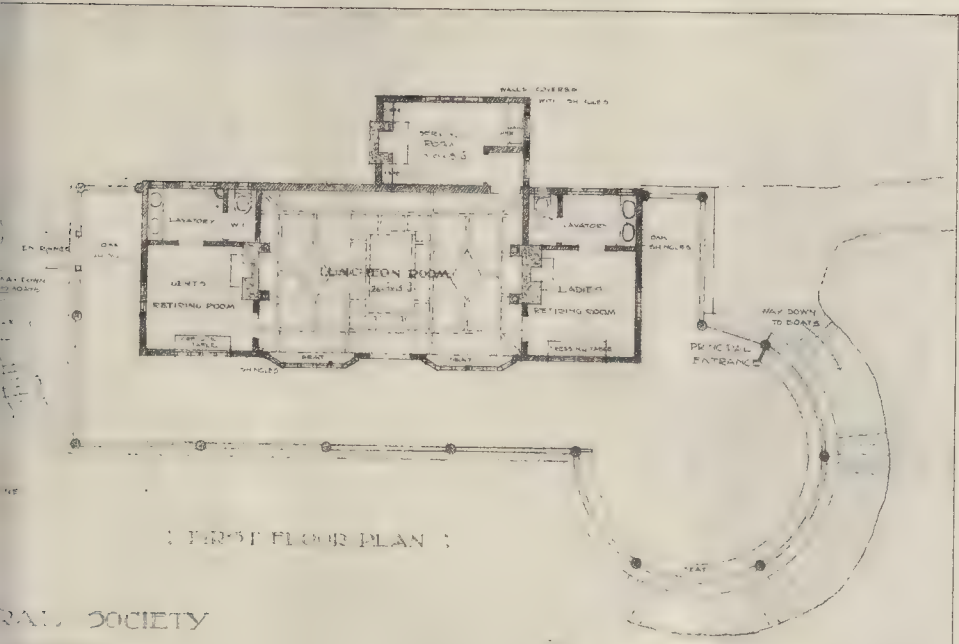
Proposed Pathological Building, Western Infirmary, Glasgow.



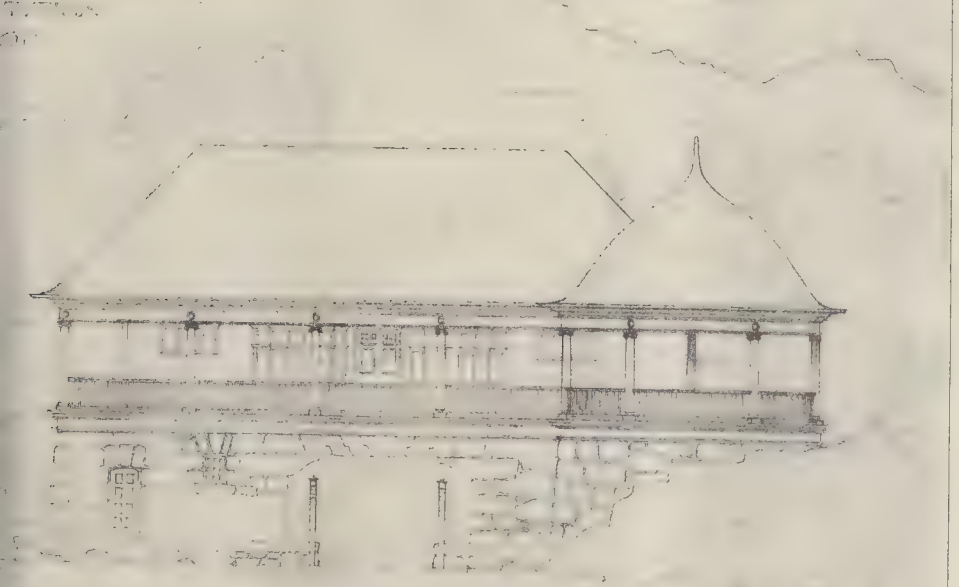




EDGE OF  
CITY IN  
A LANE  
TO "DUD"



RAIL SOCIETY

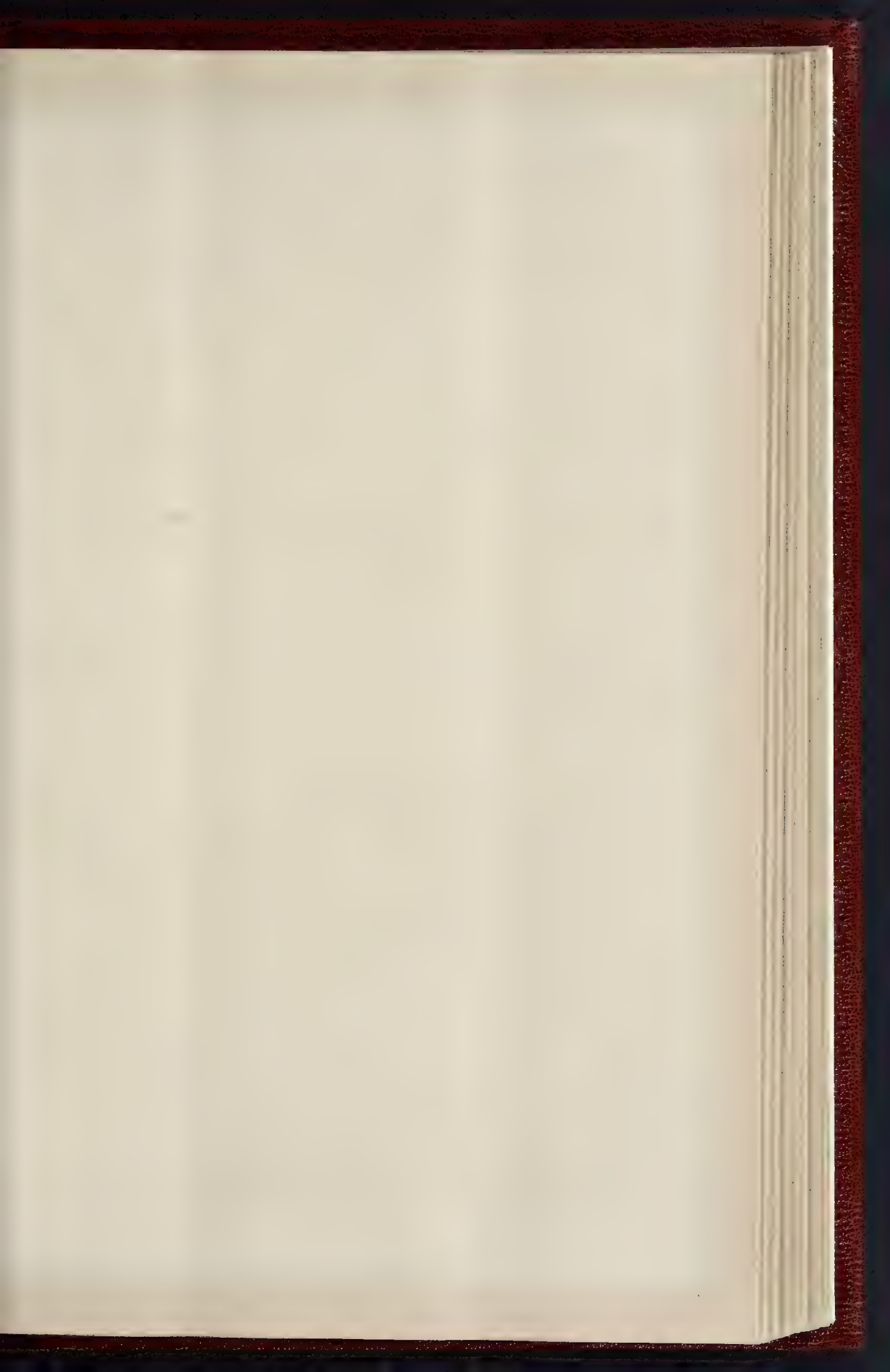


: FRONT :

Wm D. Black.

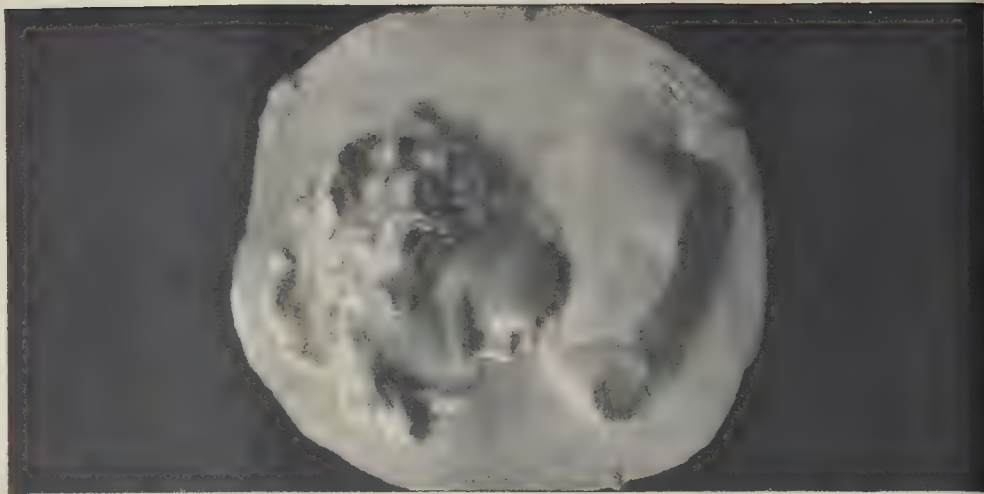
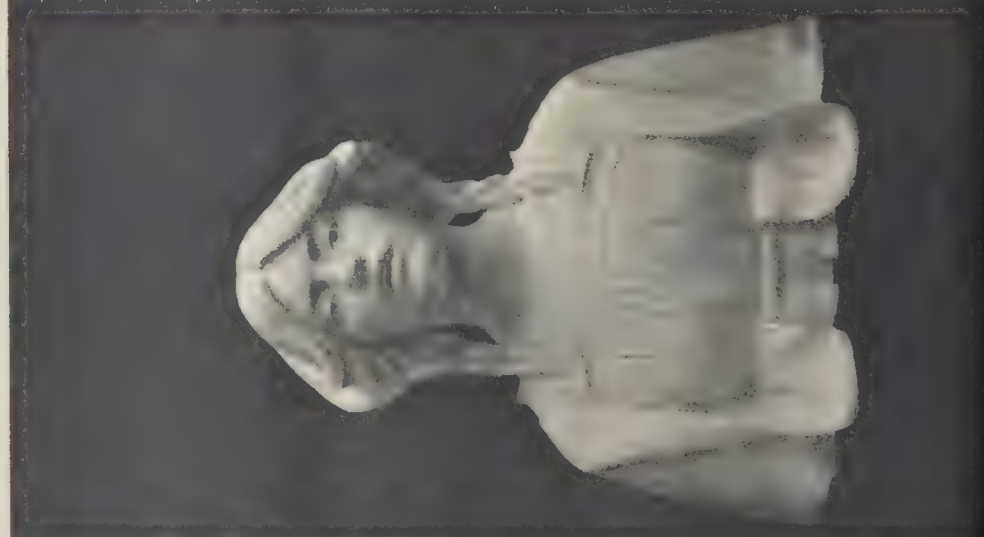
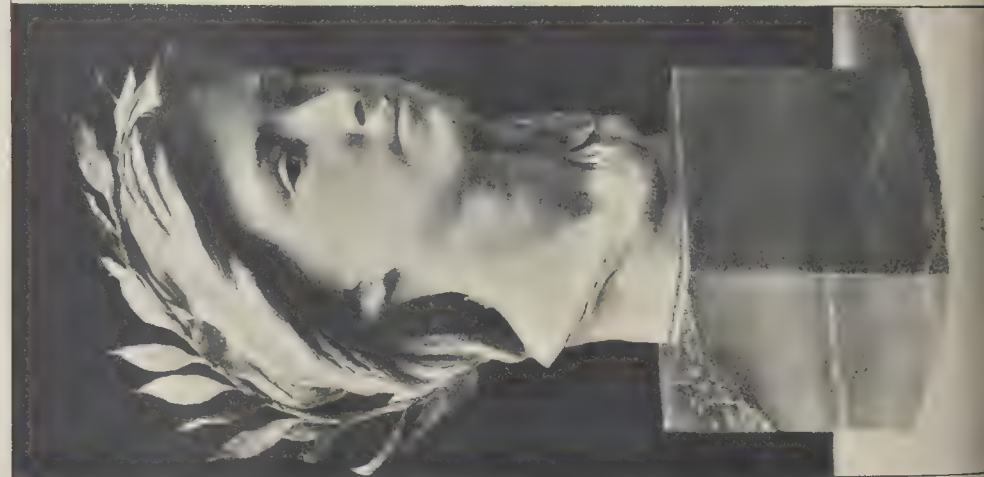








THE BUILDER, MAY 19, 1894





"THE GOBLET OF LIFE;" PLASTER.—MR. ALBERT TOFT.  
(*Royal Academy.*)



"RISING OF THE DAWN." MR. J. ROSE & MULLINS.  
(*New Gallery.*)



"A VANISHING DREAM." MR. A. C. LUGNANI.  
(*Royal Academy.*)

SOME SCULPTURE OF THE YEAR









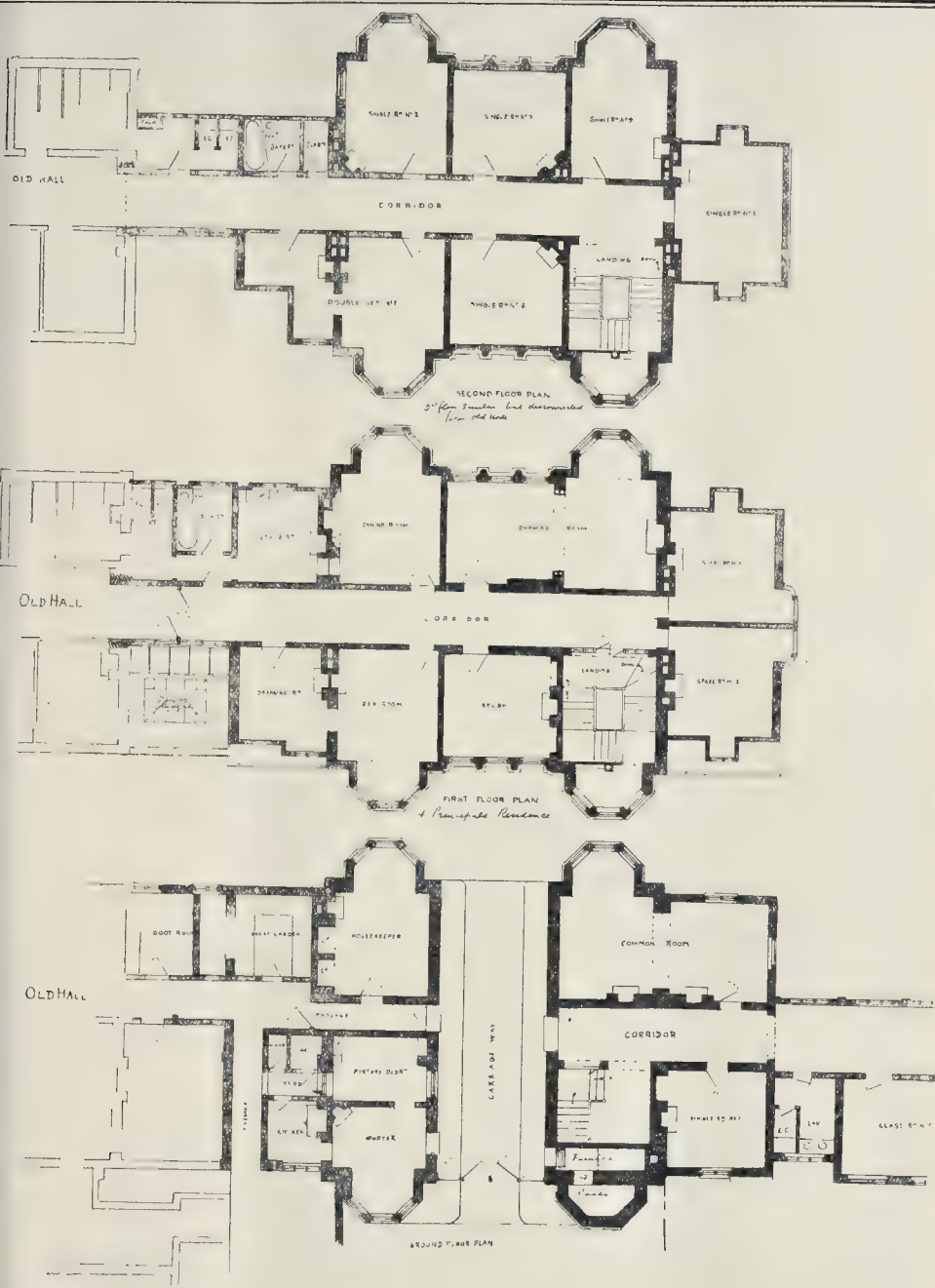
THE BUILDER, MAY 19 1864











Plans, Pfeiffer Building, Newnham College, Cambridge.

of hot coil pipes will be placed to increase exhaust.

The building will be heated throughout by n-pipes, carried along an underground duct the new steam laundry buildings adjoining, each coil will have a fresh-air supply. Provision is also being made for lighting the building electricity.

The whole interior will be finished in such a way as to admit of being easily and thoroughly used, all corners being slightly rounded, and

every possible means adopted to prevent the harbouring of germs or the lodgment of dust.

The architects are Messrs. John Burnet, Son, & Campbell, of Glasgow.

#### THE PFEIFFER BUILDINGS, NEWNHAM COLLEGE.

The "Pfeiffer buildings" form the latest extension of Newnham College, the cost of which has been mainly defrayed from a bequest from the lady

whose name it bears. They are so arranged as to form a connexion between the old and Sidgwick halls, the latter of which is already united by a corridor with Clough Hall. Thus a complete passage way, under cover, is established between all the separate halls of which Newnham College consists.

As the new building has to extend over the main entrance to the quadrangle, it has been cast in the form of a gateway tower, and the entrance is commanded by a porter's lodge. In



the outer gateway will shortly be placed the memorial gates to be presented by former students in honour of Miss Clough, the first principal of Newnham.

The first floor of the gateway tower is arranged to form a flat, the residence of the present principal. The portion of corridor and class-room shown on the right of the plan is the commencement of the corridor of connexion referred to, which we could not very well find room for on the page. It extends some little distance to the right of the plan, with class-rooms opening out of it, and then is returned at a right angle to the left, as a corridor only, communicating with Sidgwick Hall.

#### DESIGN FOR BOAT-HOUSE.

This design resulted from an offer on the part of the Committee of the Liverpool Industrial Exhibition, 1894 (to which we have before alluded), to give a prize to the best of a set of competitive designs sent in by students of the Liverpool Architectural Society, the drawings to be exhibited at the Exhibition, which was held from the 9th to the 18th of April. The subject given was "A Private Lake Boat-House," the requirements being as follows:—A boat-house suitable for two boats, with luncheon-room over, having serving-room and retiring-rooms attached—the sizes of the various rooms being left to the discretion of the competitors, as also the style and materials. The adjudicators were Mr. H. Hartley, Mr. T. H. Harrison, and Mr. A. Culshaw, Fellows of the Institute of Architects. The prize was awarded to Mr. Arthur Morgan, of Chester, in the first instance, but it was afterwards discovered that he was ineligible to compete, and the prize was, therefore, transferred to the second best design, by Mr. Otis W. Black, which we publish. We must add that we only received this latter piece of information, as to the transference of the prize, after we had lithographed Mr. Black's design for publication, and we should have thought it more creditable to him if he had told us the facts fully at first, instead of leaving us to find them out from an official letter of the Secretary of the Students' Committee of the Liverpool Architectural Society.

The design is a good one, especially in avoiding the tendency to rustic or mis-called "picturesque" design which is often indulged in such constructions; it is sufficiently architectural while preserving a certain lightness of character. The plan has faults; the doors of ladies' and gentlemen's dressing-rooms should not be exactly opposite each other, nor should they be close to the dressing-tables. We are glad to publish the design as a record of the result of a praiseworthy action on the part of the Industrial Exhibition Committee in offering encouragement to architectural students.

The fact that there is no scale to the drawing is the result of an undesirable and inconvenient practice too often indulged in in competitions, of merely writing on a drawing "scale 8 ft. to an inch" (or whatever it may be), instead of drawing out a scale. When a drawing is reduced in photo-lithography, of course this statement becomes incorrect; and as the original drawing had been sent back immediately after being photographed, at its author's request, we had no means of making out a scale for the lithographed plate when the omission was discovered. This is an inconvenience applying to the special case of reducing a drawing, but for other reasons it is always best to draw out the scale on the drawing, where it is handy for reference and measurement, instead of merely stating it in words.

#### SOME SCULPTURE OF THE YEAR.

The illustrations show a few of the most characteristic of the miscellaneous works of sculpture, mostly on a small scale, in the Royal Academy, and one in the New Gallery.

Mr. A. Drury's bronze "Head of St. Agnes" is one of the most remarkable busts in the Academy this year, not only for its execution, but for the conception; the expression of the face being stern and heroic rather than that mild lamb-like expression which is commonly given to St. Agnes in painting and sculpture. Mr. Toft's "The Oracle" is to some extent another phase of the idea displayed in his head entitled "Mysteriarch" in last year's Academy; a head of solemn and abstract expression with an earnest forward gaze. Miss Halse's "Naughty" is a charming study of a child's head.

"The Rising of the Dawn" is a small miniature group by Mr. E. Roscoe Mullins, in the hall of the New Gallery.

The other two are life-size figures. That by Mr. Luchesi, "A Vanishing Dream," is in the Lecture-room of the Royal Academy, and is an ideal figure expressing the moment of realisation of a disappointed hope. Mr. Toft's "Goblet of Life" we have no doubt is founded on Longfellow's fine poem under the same title—

"Then in Life's goblet freely press  
The leaves that give it bitterness," &c.

It may be doubted whether the expression of the countenance is not rather too poignant and strongly marked for sculpture; but it is a pathetic work and a well-designed figure.

#### SANITARY INSPECTORS' ASSOCIATION: ANNUAL CONFERENCE.

THE annual provincial conference of the Sanitary Inspectors' Association was held at Nottingham on the 11th and 12th insts. The inaugural address of the President, Sir B. W. Richardson, was read in his absence by Dr. Boobyer, M.O.H., of Nottingham. The local members, headed by Mr. Willbond (Local Secretary), were supported by the Town Clerk, Sir S. G. Johnson, Mr. Alderman Blackburn (Chairman of the Health Committee), and other members of the Corporation, as well as by the Mayor, the M.O.H., and Mr. John Parker, C.E. The representatives of affiliated associations included delegates from districts as widely separated as Exmouth and Newcastle; Liverpool, Manchester, Stafford, Maidstone, Derby, and many other centres in England being represented as well as London and Nottingham. The proceedings of the first day, after a conference of delegates from district councils, consisted of a series of visits to the markets, depôts, sanitary works and improvements of the borough, under the guidance of the Borough Engineer (Mr. A. Brown) and the general manager of the Eastcroft Refuse Destructor Works (Mr. T. R. Swaine). A new subway which was visited contained a novel feature in the recessed spaces under arches on each side let as workshops and stores, the rent of which pays twice over the interest on the entire cost of construction of the subway. As a criterion of the economy of such subways for carrying gas and water mains as well as main drains, the engineer stated that the old subway constructed thirty-two years ago had cost but a few shillings, while the great expense of breaking up and relaying the pavement a number of times had been entirely saved. Another innovation worthy of imitation elsewhere was the use of a small furnace invented by Messrs. Swaine & Harrison by which a large annual profit is made out of the solder, the tin, and the sheet-iron obtained from the old tin cans extracted from the town refuse.

The more public part of the proceedings took place in the Council Chamber on the 12th inst., the Mayor and Dr. Boobyer being again present. The Mayor said that they believed that they had done some things well in matters sanitary. They had a very healthy town, and some of its residents said they had a town some parts of which were beautiful, enjoyable, and very pleasant to live in. It was one of the duties of sanitary inspectors to make our towns more fit to live in than they were at present. This important duty demanded scientific and technical knowledge, which conferences such as they were then holding would help them to obtain. He hoped their visit might be a pleasant one, and that their deliberations might tend to their own advantage and that of the town of Nottingham, which was so glad to welcome them.

The President, in the course of his address, said that the great sanitary progress made in Nottingham justified him in believing that it would be found now an ideal centre in the track of improvement, the proof of progress being found in the gradual reduction of the town's death rate. Sanitarians were divided into two schools; the one holding it to be the duty of the State to control and direct all matters that concerned the public health, and the other holding this to be an error. The Government, said the latter school, was overworked, and had already tasks in hand that no Government had either time or ability to perform. The idea of an omnipotent central authority was inconsistent with the spirit of the English people and would not advance sanitation. He was in favour of the view that every local authority should in its own district be master of its position, and do what was best for the sanitary needs of the district it ruled over, but he would not advise that the State should take no part in the work. In his opinion there ought to exist a Ministry of Health, but not such a

ministry as would interfere with the work of a locality, or be itself liable to interference through changes of government. The work of a Registration Department, Meteorological Department, and a Department of Analytical and Chemical Research might be united in one supervising and consultative board, under the presidency of a Ministry of Health. This Council of Health could also be properly entrusted with the administration of the Poor Law, and of the Factory and Workshops' Acts, and the management of Prisons. To it also should be referred all questions of the construction of roads, parks, and works of water-supply, in which the Central Government might be concerned. Without interference with local matters such a council could exert the most beneficial influence by answering questions put by local authorities, and by receiving, analysing, condensing, tabulating, and redistributing to the people at large, all information concerning matters of life and health. It could, in short, as one uniting centre, assist all local centres, and bring them into harmonious action. The paper concluded with advice to the sanitary inspectors to be united among themselves, to acquire systematic education on special subjects, and lastly to go through a practical course of instruction bearing on the duties of their offices, and to attend regular courses of lectures on sanitary engineering and other subjects bearing directly on the best means of preserving the public health. With regard to the vexed question of examination for the office of sanitary inspectors, he said the inspectors were themselves most anxious that a proper examining board, and a proper examination for them, should be instituted. The inspectors, who knew better than any other body the practical requirements of their work, should not be kept out of participation in the formation of such a board, but should rather be invited to take part in it. By the means he had spoken of the sanitary inspectors would constitute themselves through the popular will into a new order. Finally, said the President in his paper, their Association would be strong enough to stand alone, and ought to be saved in future from every obstacle to the successful working out of the honourable and useful task before it, that of securing its own unity and complete organization.

Mr. H. Thomas, who, in the absence of the President, had taken the chair, moved a vote of thanks to the Mayor and the Health Committee, to which the Mayor responded. Thanks were also voted to Sir B. W. Richardson for his address. Two other papers were read, the first by Dr. Boobyer, in which he offered some advice particularly to the younger members of the Association, and the other by Mr. F. T. Poulson (Staffordshire County Council), on the question of "Security of Tenure of Office" by Sanitary Inspectors.

Dr. Boobyer reminded the young inspectors that the first essential of fitness for the office was a thorough knowledge of his subject, and then a second a conscientious devotion to duty. The inspector who understood his work would certainly believe in it, and then speak would the general public and the Sanitary Authorities. Enthusiasm was often derided, and theoretic knowledge scoffed at, but the Inspectors would be misled if they listened either to the sneerers or the scoffers. Enthusiasm, tempered with discretion was a high qualification for an Inspector, and was of the greatest assistance to him in dealing with the inertia of ignorance or the active opposition of interested persons; and without a foundation of theoretic knowledge this so-called practical ability would be of little value. Much was said at meetings like that of the relations between Inspectors and Medical Officers of Health, and he hoped his motives would not be misunderstood when he said that he disapproved, at the present juncture, of placing the Inspector in a position independent of the Medical Officer, in the way that obtained in some parts of Scotland. The objects aimed at by the Medical Officer of Health and the Sanitary Inspector ought to be, and were, the same, but if these officials were working at cross purposes, the public would be the losers, and their work and authority would suffer. Above all, let them not suppose that they had reached, or come within measurable distance of, finality in their knowledge or their methods. All who had eyes to see agreed that the science of Public Health was an infant—and an infant yet in long clothes.

Mr. Poulson in his paper pointed out that, by the Public Health (London) Act of 1891, Medical Officers of Health could not now be appointed for a limited period only and could not be removed by the sanitary authority except with the sanction of the Local Government Board. He further



pointed out that the two words "Sanitary Inspector" followed the words "Medical Officer of Health," in the section of the Act referred to, as it was drafted, but that—and the fact was a lamentable one—these two words were expunged at a later stage, at the instance of a member of the British House of Representatives. If the M.O.H. needed the protection of the Act, for fixity of tenure in his office, the Inspector required it also. Under the system of annual appointments, he was subjected to antagonistic influences and was often compelled, in order to avoid giving offence to persons who had it in their power to oppose his appointment, to "tone down" the lurid glare of nuisances in his district, and make them appear less injurious than they really were. If he "put matters too strong," the consequences might be disastrous to himself and his family. Mr. Foulson urged the Association to endeavour to enlist the sympathies of the public through the Press and the individual members of the Association to send information of meetings addressed by candidates for municipal and Parliamentary honours, to their local secretaries, in order that questions might be put to ascertain whether they were or were not in favour of giving fixity of tenure to sanitary inspectors.

Votes of thanks were accorded to the readers of both the papers, on the motion of Mr. Wilkinson (Derby) and Mr. Jacklin (Maidstone) supported by Mr. Fairchild, (Clapham), Mr. Lindley Batley, Mr. Washington Lyon (hon. member), Mr. Councillor Robinson (Nottingham), and the chairman, who declared Mr. Foulson's paper to be the best he had heard on the subject of "Tenure of Office." Votes of thanks were also accorded to the local secretary, Mr. Willbond, and the President.

Before the meeting closed Mr. Tidman, C.E., moved a resolution calling upon the conference to put on record an expression of regret that the Sanitary Inspectors' Association in the list of bodies invited to prepare a scheme of examinations for sanitary inspectors. The motion was carried unanimously, and the members were invited to partake of a luncheon, provided in another part of the building by the courtesy of the Health Committee.

In the afternoon the visitors proceeded in a body to the Guildhall, where a large photographic group was taken, the provincial and metropolitan representatives of Councils, under the presidency of Mr. H. Thomas, meeting again at a later hour in the Council-room, for the discussion of proposed alterations of rules. This terminated the proceedings.

#### HARRIS TECHNICAL SCHOOL COMPETITION.

We have been asked to publish the following correspondence:—

22, Guildhall-street, Preston,

May 2, 1894.

GENTLEMEN,—We, the undersigned unsuccessful competing architects for the erection of the Harris Institute, Council, desire to draw the attention of the Harris Institute Council to the following points in connexion with the competition which appear to us, on the face of them, to constitute a breach of the terms under which we entered into the competition. It would appear:—

(1.) That the first clause of the Instructions lays down "that the amount for shell of building from bottom of footings upwards, including supply of gas, water, and low-pressure heating apparatus throughout the building, painting, finishing, and architects' commission, must not exceed 8,500."

(2.) That the Council have selected, and are about to carry out, a design which is to cost 13,000.

(3.) That the coarseness of the design—according to the statement of a member of the Council, Mr. Healey—has been cut down to come within this 13,000.

We would desire to point out that, under these circumstances, those competitors whose designs are in accordance with the limit of cost laid down are thus placed in an unfair position by the acceptance of a design which, by the first clause of the Instructions, ought to have been disqualified. Having regard, therefore, to our rights as competitors, and with a view to ascertaining our position, we would respectfully request that the Council should satisfy us on the following points:—

(1.) Whether the selected design is proposed to be carried out.

(2.) Whether the contract plans are in conformity with the design as selected, or otherwise.

(3.) Whether the contract plans include any greater extent of building than the 8,500, was stipulated to provide for, including architects' commission, and whether they

include "supply of gas, water, low-pressure heating apparatus throughout the building, painting, and finishing."

We are, Gentlemen, respectfully yours,  
JOSEPH V. HIBBERT (Preston).  
G. SEDGER (London).  
GARLICK & SYKES (Preston).  
STONES & GRADWELL (Blackburn).

#### HARRIS INSTITUTE, PRESTON.

May 9, 1894.

DEAR SIR,—Your letter of the 2nd inst. addressed to the Council of the Harris Institute, signed by yourself and other architects, was laid before the Council at their meeting to-day.

The Council are unwilling to enter into any controversy on the subject of the competitive plans for the new Technical School.

The plans were reported upon by a competent and independent assessor, and the selected plan was chosen by the Building Committee, and their choice was confirmed by the Council after a full consideration of this report.

The Council consider that they have fairly and properly selected the best and most suitable plan, and that no competitor has any reason for complaint.

Will you please communicate this reply to the other gentlemen who have signed the letter.

I am, yours truly,

THOMAS R. JOLLY, Secretary.  
Jos. V. Hibbert, Esq.,  
Guildhall-street.

#### COMPETITIONS.

GILLINGHAM AND GRANGE U.D. SCHOOLS.—The result of the competition for schools in the St. Barnabas' district of the Gillingham and Grange School Board was made known on the 10th inst. A special meeting of the Board was held to consider the plans, and the following eight designs were selected, the final selection being deferred:—"Light and Air," Matthew Chambers, Chatham; "Thought," J. W. Nash, Rochester; "Father Thames," P. A. Todd, 33, Old Queen-street, Westminster; "Educational," J. M. Pinn, Exeter; "Neptune," E. Habersham, Lonsdale Chambers, 27, Chancery-lane, London, W.C.; "Experience," G. E. Bond, Rochester; "Practical," M. Chambers, Chatham; "Fortuna," F. Hingston, Portland House, Basinghall-street, London, E.C.

CHURCH, COCKINGTON, TORQUAY.—Twenty-one designs were sent in on May 1 in response to an advertisement inviting designs for a new church for Cockington, which is now practically a suburb of Torquay. The assessor, Mr. H. H. Statham, after going carefully through all the designs, selected five for special consideration, Nos. 2, 4, 11, 15 and 16. All of these presented considerable one or two of them exceptional, merit architecturally, but on more detailed examination the assessor concluded that no one of them could be built for the stipulated sum (5,000*l.*) except No. 4, which was accordingly selected, and was found to be by Mr. C. A. Nicholson, M.A., of London. Mr. Nicholson has adopted the form, common in old Devonshire churches of the district, of three nearly equal aisles in the nave, each with a ridge roof, and no clearstory; a form of design which, avoiding lofty walls and multiplication of windows, is essentially economical; a paramount consideration where it was desired to provide a church to seat 600 at the low cost of 5,000*l.*

#### ARCHITECTURAL SOCIETIES.

SHEFFIELD SOCIETY OF ARCHITECTS AND SURVEYORS.—The annual meeting of this society was held at the School of Art on the 10th inst., Mr. E. M. Gibbs, the President, occupying the chair. The hon. secretary read his annual report which was adopted after some discussion. Mr. Gibbs remarked, in moving the adoption, that there was a good field of work for the new Council to take in hand, and he thought that more might be done in the future than had been attempted in the past if the younger members especially put their hands to the work and cordially supported the new Council. The Treasurer's report was also read and adopted, and it was decided that both reports should be printed and circulated. The deaths of the late E. McDougall and B. H. Wightman, Fellows, were announced, and votes of condolence with their families were agreed to. A ballot then took place, Messrs. C. Gibson and E. Winder, jun., acting as scrutineers, for the election of officers and Council for the ensuing year, with the following result:—Mr. E. M. Gibbs was re-elected President; Mr. E. Hadfield was elected Vice-President; Mr. F. Fowler, Treasurer; and Mr. C. J. Innocent, Hon. Secretary, and the following

gentlemen in addition to the past Presidents were elected to serve on the Council:—Messrs. R. Fowler, J. Smith, H. W. Lockwood, and Thos. Winder, Fellows, and W. C. Fenton, Associate; and Mr. J. R. Wigful and Mr. J. B. Mitchell-Withers were elected Auditors. The President pointed out that Sheffield had been made, by agreement with the Royal Institute of British Architects and the allied country architectural societies, the centre of a province, which included Derbyshire, Northern Lincolnshire, and part of South Yorkshire, and on his suggestion a draft letter, to members of the Royal Institute residing in the province, was read and adopted. A discussion then took place on the general working of the society, and a number of resolutions were passed for the early consideration of the new Council.

#### Correspondence.

To the Editor of THE BUILDER.

#### THE HEATING AND VENTILATION OF THE HOUSES OF PARLIAMENT.

SIR,—I have no desire to continue this correspondence, but I beg to enter my protest against the misrepresentation and rather ungenerous language in which your correspondent, Mr. William Henman, indulges.

Your leading article criticised the Report most fairly and favourably, only you objected—under error—to one of my recommendations, which error—after being pointed out by me—you most courteously admitted.

From what Mr. Henman writes, in the 4th paragraph of his letter, it does appear to me that he has neither seen nor read the Report in question, and I shall be only too pleased to send the gentleman a copy, should you very kindly favour me with his address.

Sir Isaac Holden, Bart., M.P., is one of the most wonderful men of the century, and understands the science of ventilation, practically, if any man does.

This venerable baronet and successful inventor writes:—

"I have read with care your Report, and find it everything I could wish. It is very sound, both scientifically and practically. I hope it will lead to improvement."

An eminent architect and well-known specialist in ventilation writes:—"I have read with interest your report on the Houses of Parliament. I think you have put your finger on the true cause of the stuffiness of the House of Commons. I have before now tried (very much in vain) to drive the idea into people's heads that one can pass an ample supply of fresh air through an apartment without ventilating it. What you suggest is the proper remedy."

I think these samples of unbiased opinion—of many I have already received—from experts, may safely be placed against that of Mr. William Henman and his elementary facts.

Perhaps I may be allowed to add, that so long as architects hold views on ventilation similar to those expressed by your correspondent—who apparently pins his faith so firmly to the Plenum system or "propulsion pure and simple"—colossal buildings like the Houses of Parliament, the London Law Courts, the National Liberal Club, &c., will continue to be notoriously badly ventilated in every sense of the term.

JAMES KEITH,  
Assoc. M. Inst. C.E.

#### BOILER EXPLOSIONS.

SIR,—"*Æolus*" writes as if all that were necessary to make the hot-water fittings in our houses perfect as to working and safety were to stop giving such work to plumbers, and to let it be done only by "hot-water fitters." It seems to me, however, that hot-water fitters have enough to do with pleasing their customers as it is, as to giving satisfactory heating, without asking them to dabble in plumbers' work.

One friend of mine who does a large amount of work in hot-water fitting for heating buildings does nothing, so far as I am aware, in the way of interfering with hot-water work for plumbing sanitary appliances. Ironmongers, again, here employ plumbers to fit in the hot-water pipes when fitting in their kitchen ranges. The "plumber" who cannot fit in the hot-water pipes to and for his sanitary appliances as well as the cold ones is only half a plumber—his education in his trade is only half-finished. "*Æolus*" has told us nothing new in the way of precautions. These have been pointed out often before, but in the case, *æ.g.*, of dead-weight safety-valves it is difficult, and especially in new work, to get the architects or measurers to specify them in the schedules, and the plumbers can hardly be expected to be so philanthropic as to either put them on for nothing, or to do so in defiance of the architect or customer. I have lately used dead-weight safety-valves myself on the top of the hot-water tank a few feet from the boiler, while I have had a safety-valve on the upper pipe between the tank and the boiler in my own



house for the last ten years, so if "Æolus" be a "hot-water fitter" himself, there is nothing in his letter to show that he can teach us anything as plumbers, so far as the hot-water work of plumbing sanitary appliances is concerned. There are good and bad plumbers, just as there are good and bad hot-water fitters. If the work be given to an incompetent man, be he "plumber" or "fitter," the result is likely to be unsatisfactory. Cheap estimating also tempts to bad work, such as I came across a few days ago and condemned—possibly it was done by a "hot-water fitter"—viz., connecting the hot-water crane at the kitchen sink to the circulating pipe between the boiler and tank (so as to save a few feet of pipe), instead of connecting to above the

## The Student's Column.

### THE STRUCTURE AND PHYSICAL PROPERTIES OF BUILDING STONES.—XX.

#### 7. THE COTTESWOLD DISTRICT.

VERY large number of quarries, for the most part used for purely local purposes, are situated in the oolitic rocks stretching northward from Bath to the neighbourhood of Cheltenham and beyond. The accompanying geological sketch map (fig. 32) indicates the sites

granules and fragments of crinoids, &c., are not only themselves very crystalline, but the abundant matrix holding them together is equally so. The harder stones break with a hackled fracture. The internal decoration of Magdalen College Chapel, Oxford, is of Leckhampton stone.

Tainton, some miles to the south-east of Leckhampton, has been celebrated for many years for its freestones, though quarries at Tainton itself—on the downs—are either closed or spasmodically worked. They provided material for some of the oldest buildings in Oxford, viz., those of the twelfth, thirteenth, and

fourteenth centuries which are still in a good state of preservation. The church at Burford and many other edifices in the vicinity, are also witnesses of the excellence of the material. I was used in the interior of St. Paul's Cathedral and in many other London churches.

The Great Oolite has been extensively quarried at Windrush, in the same district, where the stone is followed under the hill by tunnelling. The material is a fine white oolite, coming out in large blocks, the only zone for quarrying being about 7 ft. in thickness. It may be described as a cream-coloured stone, with fine oolitic granules in crystalline matrix, fragments of shells, &c., being very abundant. Four miles to the east at Burford, are several freestone quarries supplying the wants of the neighbourhood.

The building stones of Painswick are, perhaps better known than any others on the Cotswolds, and deservedly so. They are situated on the high ground to the north of the village. The student may be cautioned as to the source of origin of several so-called "Painswick stones" which do not come from the point now under consideration, but are found near Stroud, and on the road to Tetbury. Indeed, the term seems to be applied to all the cream-coloured building stones raised some miles to the south and east of Painswick. In the vicinity of the last-mentioned place are four principal workings, known as Plantation Quarry, Painswick Hill (Hedge Hill), and Fritton quarries respectively.

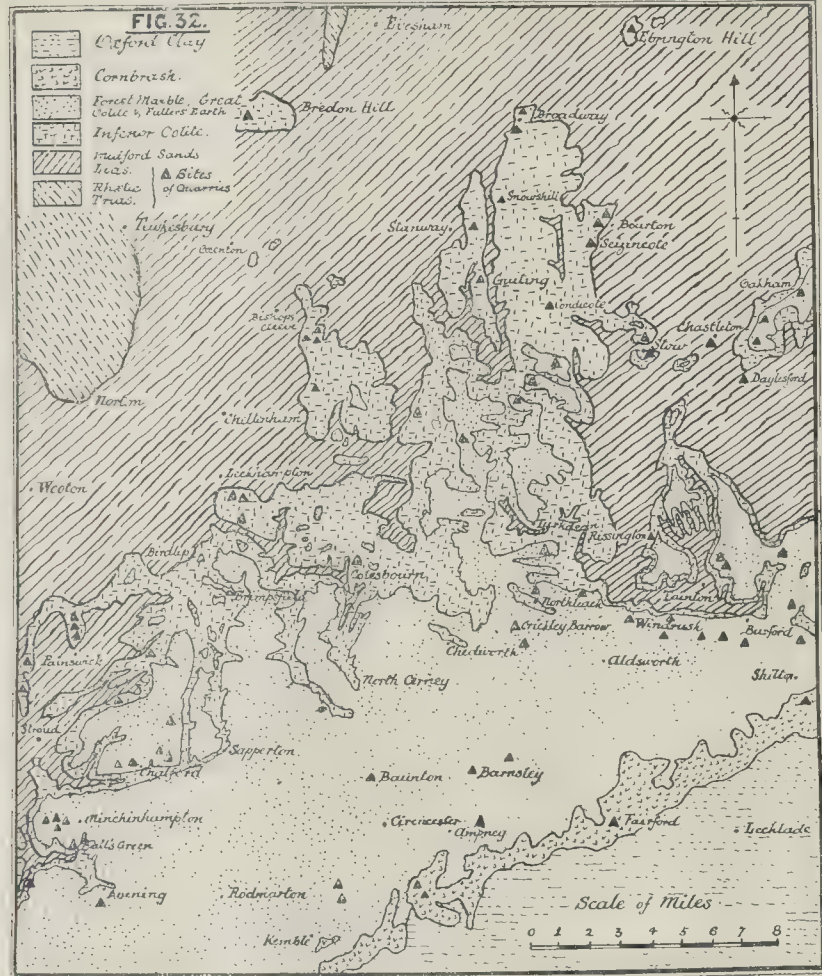


FIG. 32.—Geological Sketch Map of the Cotswold District.

tank. The bad effect of this was to empty the tank if cold supply was temporarily off.

W. P. BUCHAN.

### OWNERSHIP OF ARCHITECTS' DRAWINGS.

SIR—I shall be much obliged if some correspondent will refer me to a decision since 1870 respecting the above in the case where buildings have been erected and the architects' charges have been paid.

P.S.—Is the matter affected by the Copyright Act adverse to or in favour of the architect?

FREE LIBRARY AND TECHNICAL SCHOOL, ATTINGHAM.—Free library and technical school buildings were opened at Attingham on the 11th inst. The new building, have been erected from the designs of Mr. Poppewell, architect, Manchester.

of about eighty of the principal workings, but although we are well acquainted with many of them, we are precluded, for want of space, from describing other than the more important centres. The best areas are in the vicinity of Leckhampton, Tainton, Painswick, Minchinhampton, and Nailsworth. The building stones occur on two horizons, separated by a bed of oolitic marl, and are known as the lower and upper freestones, respectively.

The quarries at Leckhampton, situated near the summit of the Inferior Oolite escarpment overlooking Cheltenham, are regarded as classic ground for the study of that formation. The stone is let down the steep incline to the plain beneath by means of a winding apparatus, but a comparatively small quantity of the material is used for building purposes. The lower freestone is here about 110 ft. in thickness. It is, in general, rather hard, arising from the circumstance that the oolitic

Building stone, closely bedded and irregularly jointed..... 24 ft. in thickness.

The joints being so close together the average blocks yielded are rather small; but one taken out at the time of our visit measured as much as 7 ft. by 4 ft. by 2 ft. 6 in., and was about to be despatched to Gloucester Cathedral. The stone is never blasted except at such places as the joint may run tight. It is of a light cream colour, and may be described as very fine-grained, composed of minute and regular oolitic granules embedded in a crystalline matrix: shell matter is rare. It differs from the Bath stones, with which it has considerable analogy, by the more crystalline nature of the granules, and by its exceeding fine and uniform grain.

Passing out of the wood we ascend nearly

Section at Plantation Quarry.

Rubble and rough stone 24 ft. in thickness.



the summit of the hill, and walking over some  
downs see the

**Section at Painiswick Hill Quarry.**  
Overburden, rubble, and rough stone, mostly  
burnt into lime ..... 10 ft. in thickness.  
Building stone, irregularly bedded, joints  
frequent ..... 40 ft. in thickness.

The best beds are situated about 12 ft. to 20 ft.  
from the base, where we saw some blocks 5 ft.  
by 4 ft. and 8 ft. by 3 ft. 6 in. by 4 ft. The  
appearance of the stone in the quarry is very  
unsatisfactory; we noticed that when dry it is hard  
enough to take a slight polish, and were conse-  
quently not surprised to observe that its rate of  
weathering was extremely slow. Its micro-structure  
is essentially the same as that from the last  
quarry described. In selecting these Painiswick  
stones, care should be taken to see that they are  
free from small iron-stained holes. In the  
bottom beds of the quarry now being described  
these holes are somewhat frequent, and they are  
not altogether absent from any of the beds.

At the summit of the hill is a large ancient  
trenchment, several old quarries, and one or  
two new ones; judging from the enormous waste  
heaps, the stone industry hereabouts must at one  
time have been in a very thriving condition. All  
the quarries now employed in the district are  
day work; and the piece-work system is not  
adopted, even for masons and sawyers.

Returning to Stroud, we ascend the steep Rod-  
drough Hill, and taking the Tetbury road, a  
talk of three miles brings us on Minchinhampton  
Common, where there are several quarries in the  
great Oolite. The blocks obtained are of any  
practicable size, and they are of a light greyish  
tint. The structure of this stone is somewhat  
marked, as will be seen on reference to our  
illustration (fig. 33). It is made of extremely

FIG. 33.

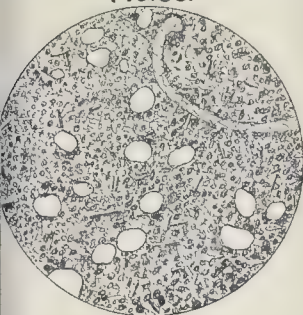


FIG. 33.—Micro-structure of Minchinhampton  
Stone.

all and crystalline oolitic granules, with equally  
small skeletonized shell fragments, and an occa-  
sional larger piece, the whole being bound  
together by a highly crystalline matrix, partly  
careous and partly siliceous. Here and there  
are free quartz sand grains, whilst ovoid holes  
note the former existence of large and appar-  
ently well-formed oolitic granules. We particu-  
larly noted that for the most part the holes were  
where the stone was *in situ*, and they do  
therefore owe their origin to the preparing  
processes. The student will see at a glance that  
the structure of Minchinhampton Common free-  
stone is totally different to that of any other  
material hitherto described. When carefully  
examined it should be durable; some beds are hard  
enough to take a slight polish. It is sometimes  
known as "Hampton stone."

**NEW FACTORIES BILL AND GLASGOW BUILDING  
REGULATIONS.**—The measure introduced by  
the Secretary to amend and extend the law  
relating to factories and workshops contains some  
interesting provisions. Under the Glasgow Building  
Regulations Act it is provided that where there is  
more than ten persons employed, it must have a  
sage or stair, having access to a street or court,  
built of incombustible material. In this respect  
Act seems to have anticipated the Bill now before  
Parliament, as it, for the first time in a public  
act, contains clauses providing a similar  
guard. —*Glasgow Evening News.*

For illustration of this see the *Builder* for October 28.

GENERAL BUILDING NEWS.

**NEW CHURCH AT PEMBROKE DOCK.**—On the  
2nd inst. the memorial stone of St. Patrick's Church,  
Pembroke, was laid by Lady Catherine Allen. The  
site for the building was given by the War Depart-  
ment, and the structure will be of hammered lime-  
stone indigenous to the locality, with Bath-stone  
dressings. The principal dimensions are—Length  
81 ft.; breadth, 47 ft.; with a bell turret at the  
west-end. The architects are Messrs. Nicholls &  
Son, Hereford, and the builders are Messrs. Davies  
& Morgan, Pembroke, whose contract is for £1,687.

**BUILDING OPERATIONS IN EDINBURGH.**—No  
fewer than thirty-four applications for warrant came  
before the Edinburgh Dean of Guild Court on the  
2nd inst. A number of them had reference to altera-  
tions merely; one or two, however, embodied rather  
extensive building schemes. The fifteen warrants  
granted included one to the North British Railway  
Company to execute alterations at Haymarket  
Station, to bring it into accordance with the scheme  
for the doubling of the railway line between Corst-  
phine and Abbeyhill.

**MEMORIAL HALL, SEAHAM HARBOUR, NEW-  
CASTLE.**—On the 5th inst. the foundation and  
memorial stones of a hall which it is the intention  
of the *employees of the Seaham Harbour bottlenocks*  
to erect to the memory of their late employer, Mr.  
Robert Candlish, were laid. The building is to be  
erected from designs by Mr. Frank Caws, architect,  
Sunderland. It will have a frontage of 40 ft. in one  
direction, and of about 55 ft. in the other. The  
Memorial Hall proper will occupy rather more than  
one-half of the site. It is about 48 ft. long,  
22 ft. 6 in. wide, and about 21 ft. high, and will be  
used as a concert-hall and meeting-room. The  
other part of the site will be occupied in front by a  
piano-room and a news-room. Over these will be  
the committee-room. The main entrance will have  
a wide double doorway, surmounted by a semi-  
circular terra-cotta arch, resting on carved side  
columns. The arch covers a porch, at the back of  
which are the main doors admitting to the hall, and  
over these are fanlights executed in stained glass.  
Above the porch is a small music-gallery com-  
municating with the news-room. All the windows  
of the hall and main front will have cathedral-tinted  
leaded glass, and there will be a dado of pitch pine  
round the hall about 4 ft. high. Inside the hall will  
be placed a bust of the late Mr. Candlish, modelled  
in high relief by George Tinworth. The contractor  
for the whole of the work is Mr. George Gradon, of  
Durham; the plastering has been sub-let to Mr.  
R. G. Kirtley, Sunderland; the plumbing to Mr. J. G.  
Kirtley, Sunderland; and the painting and glazing  
to Mr. G. N. Arnison, Sunderland.

**METHODIST CHAPEL, BELFAST.**—On the 4th  
inst. the new chapel at Osborne Park, Belfast, was  
dedicated. The ground on which the edifice is erected  
is situated near the Lisburn-road end of Osborne  
Park, on which it has a frontage of 100 ft. The  
internal dimensions of the church are 68 ft. long  
and 35 ft. wide, in which provision has been made  
for seating 420 adults. The elevations of the build-  
ings are in Late Gothic style, built of red bricks,  
with dressings of red sandstone. The front eleva-  
tion contains the entrance doorway, over which  
is a four-light window with cusped work in the  
heads of the lights. The buttresses in the front are  
terminated by pinnacles of wrought stone. The  
body of the church has two aisles, with pews in  
the centre, and also at the sides. The pulpit is con-  
structed in pitch pine, with moulded arcading.  
Accommodation for the choir has been provided on  
a raised platform adjacent to the pulpit, behind  
which is situated the organ loft for the organ. The  
roof timbers, which are exposed to view, have been  
built of pitch pine, the ceiling being formed by  
sheeting, the underside of rafters with wood of light  
colour. The windows are glazed in cathedral leaded  
lights. The church is heated by Musgrave's small-  
boiler apparatus, and the gasfitting executed by Mr.  
Willis. The church has been erected by Mr. Kidd,  
from the plans and under the superintendence of  
Mr. J. J. Phillips, C.E., both of Belfast.

**THE RESTORATION OF PETERBOROUGH CATHEDRAL.**—A dedicatory service was held at the  
Cathedral Church of St. Peter's, at Peterborough,  
on the 10th inst., to celebrate the completion of the  
restoration of the edifice. The new work consists  
of—1. An organ by Hills & Son, costing £4,000;  
2. The reredos and baldachino of alabaster, at a  
cost of £1,300, of a design in the church of Santa  
Maria Cosmita, in Rome. The architect was Mr.  
J. L. Pearson, R.A.; 3. Choir gates of hand work-  
manship by Singer, of Frome; 4. The sanctuary  
screens of hand-wrought grill work by Gibbons and  
White, £400. These fill the four east bays of the  
choir; 5. The completion of the mosaic pavement,  
by Messrs. Davison, the builders of the baldachino;  
6. The re-table of alabaster; 7. Eight stalls, the  
work of Messrs. Thompson, of Peterborough;  
8. Altar-rails, sub-stalls, lay-clerks', and chorists'  
seats; 9. Credence table of Hoptonstone, the whole  
costing £9,000, in addition to 30,000, already  
expended.

**TOWER, BLACKPOOL.**—The Blackpool Tower  
was opened to visitors on Monday. The buildings  
were commenced during the winter of 1891-92.  
Although the structure itself has been practically  
finished, other details of the original scheme, such  
as restaurants, assembly-room for dancing, &c., are

still in course of construction. The formal opening  
will not take place until late in the season. From  
the base to the top of the steel flagstaff, the tower  
is a little over 500 ft. high. The main platform is at  
a height of 410 ft., being completely under cover and  
cased in with plate-glass fixtures. Two lifts, worked  
by hydraulic power, make the ascent and descent in  
a little under one minute for each journey. Messrs.  
Maxwell & Tuke, of Manchester, were the designers  
of the tower. Messrs. Heenan & Froude, of  
Manchester, supplied the steel and iron work, let-  
ting the subcontract of erection to Mr. James Bell,  
of Liverpool.

**CATHOLIC SCHOOLS AT BLYTH.**—The Rev. John  
Cutburt Hedley, O.S.B., D.D., recently laid the  
corner-stone of new schools to be built in connexion  
with Our Lady and Sir Wilfrid's Catholic Church,  
Waterloo-road, Blyth. The structure is to be  
built of ordinary red brick with stone facings, and  
will comprise two large class-rooms and a mixed  
school. Mr. Charles Walker, of Newcastle, is the  
architect, and Mr. Cecil E. McCann, of Malvern,  
the builder.

**CHURCH, SKELMANTHORPE, YORKSHIRE.**—On  
the 12th inst. the Bishop of Wakefield laid the  
foundation-stone of St. Aidan's Church, at  
Skelmanthorpe. About eight months ago move-  
ment was set on foot to build a church, and a  
building committee was appointed. Messrs. Bodley  
& Garner, of London, prepared plans for the church,  
estimated to cost £4,000, if the whole were carried  
out, or £3,000, if the south aisle were not built. The  
tender of Messrs. George Hinchcliffe & Son, con-  
tractors, Clayton West, for the new scheme was  
£2,407, and this was accepted.

**RESTORATION OF BACTON CHURCH, WALES.**—  
On the 8th inst. the ancient Welsh Church at  
Bacton, near Pontefract, was reopened after under-  
going restoration, at a cost of £1,000. The work  
has been carried out by local workmen, under the  
direction of Messrs. Nicholson & Son, architects,  
Hereford.

**FREE LIBRARY, GORTON.**—A free public library  
for the Gorton district, established by the Manches-  
ter Corporation, was opened on the 5th inst. by Dr.  
A. W. Ward, Principal of Owen's College. The  
library is built on a triangular plot of ground  
situated at the junction of Gorton-lane and Belle  
Vue-street. The portion at the junction of the two  
streets is an octagon measuring 29 ft. 6 in.  
in diameter, and communicating by wide arched open-  
ings with two wings, each 21 ft. wide, facing the two  
streets, the portion between them forming an open  
area for light. The ground floor is 6 ft. above the  
street level, in order to give good light to the base-  
ment floor, in which is a boys' reading-room, book  
store, and heating apparatus. The entrance to the  
building is in Belle Vue-street. A staircase leads  
up to the first floor and down to the basement,  
the staircase hall having an octagonal end with large  
windows lighted from the area. To the left of the  
entrance on the ground floor is the library, which,  
with the rooms for the attendants, occupies the  
whole of the floor. The library is fitted with book-  
cases, &c., all constructed of pitch-pine, stained  
and varnished. It is lighted with windows on all  
sides. The first floor is entirely occupied by the  
reading-room. The warming of the building is  
carried out with hot-water in pipes and radiators,  
and this and the ventilating arrangements have been  
done by Mr. E. Hutton, of Manchester. The eleva-  
tions are faced with grey bricks, with red terra-cotta  
in windows, door, cornice, and string-courses. A  
feature has been made of the octagonal corner,  
which is covered by a hipped roof crowned by a  
square clock turret. The total height from the  
street level to the top of the iron vane is about 8 ft.  
The clock, which has four illuminated dials, has  
been supplied by Messrs. J. & T. Foster. The cost  
of the building and fittings has been about £4,000.  
The whole of the work has been carried out by Mr.  
Thorpe, contractor, of Cornbrook, from the designs  
and under the superintendence of Messrs. J. W. &  
R. F. Beaumont, architects, Manchester.

**WEST RIDING COUNTY COUNCIL OFFICES.**—  
The tender of Messrs. Armitage & Hodgson, con-  
tractors, of Leeds, has been accepted for these  
offices, to be erected at Wakefield; the amount of  
the tender is £75,824.

SANITARY AND ENGINEERING NEWS.

**WEST WORTHING WATERWORKS.**—On the  
5th inst. the new reservoir erected by the West  
Worthing Waterworks and Baths Company, at a  
cost of over £5,000, on the high ground at Coate,  
was opened. The site is about three miles from  
Worthing, 125 ft. above the sea level. The work  
was designed and carried out under the supervision  
of Messrs. Quick & Son, water engineers. The  
reservoir is formed of concrete, and covered with a  
concrete roof, and is capable of holding 150,000 gals.,  
while it is so designed that it can be enlarged at any  
future time. The contractor was Mr. W. W.  
Smith, of Worthing. The opening of this reservoir,  
says the *Daily Telegraph*, enables the West  
Worthing Waterworks Company to deliver a  
constant service of water throughout the whole  
district covered by their Parliamentary powers, while  
by a trifling addition they can be made to afford an  
abundant supply for the whole of Worthing in case  
an emergency should arise.



**WATER SUPPLY OF NEWCASTLE.**—In the course of an official report, Mr. W. G. Laws, the City Engineer of Newcastle, says:—The total storage on March 7 only amounted to 1,923,000 gallons. No water to speak of has been obtained since, and the chances of getting any large quantity before next winter are not good. It is clear that the only chance for making the limited supply last out is by economising it in every possible way both for public purposes and in private houses. Should the same rate of consumption go on as prevailed last year, the present stock would only last four months, and then we should have got the last drop—that is, in the middle of September we should have to resort to water pumped from the Tyne, and to get that, must largely curtail or stop the trade supply. Fortunately, the daily consumption so far is not above ten millions, as compared with fifteen last year, and if this limitation can be kept up through the summer, we can look forward to six months before we come to Tyne water; that is, to the middle of November. The new works of the Water Company, in the valley of the Rede, cannot possibly afford any relief before the middle of 1895, if even then. By that time their new mains may be laid so far as to enable them to take a limited and intermittent supply from the Rede, which could not exceed six millions per day, and that only at intervals. It will be seven years before their new Catleugh Reservoir is completed, and then, and not before, a constant supply of seven to eight millions a day may be relied on. But for the present year we are in the position of having to face the possibility of drinking Tyne water pumped at Wylam. Analysis shows but little difference in the quality of water taken from the river at Wylam and that obtained direct from the gathering-grounds at Colt Crag. Chemical analysis, however, is but a very rough way of arriving at the relative purity of water. I venture to think that Dr. Koch's researches will revolutionise present ideas on filtration and its practice, and will go far to remove prejudices against rivers as a source of water supply. These facts are not mentioned with any view of suggesting that we should not go to the purest possible source for our water—that no one could possibly advise—but to show that in case of real necessity, the prospect of drinking river water need not be very alarming. If the needs of the large towns go on increasing at the rate at which they have done within late years, we are within measurable distance of the time when all the available head water of the water-sheds will be taken up, and future extensions will, of necessity, have to be lower on the streams and rivers; and the population on the rivers is, slowly perhaps, but perceptibly, becoming denser, so that even the head waters are gradually deteriorating. In view of this, it is comforting to know that modern scientific research points to the possibility—nay, probability—that river water may, by careful treatment, be made to yield a perfectly pure and wholesome drink for the people.

**SEWAGE WORKS, RAWDON.**—The Local Government Board have now approved a loan of 4,466l. for land, and 11,000l. for works of sewerage for the district of Rawdon in Yorkshire. The sewage will be purified by chemical precipitation in tanks followed by land filtration on 15 acres of land. The scheme has been delayed for some time through the arbitration for the purchase of the land. The engineer to the scheme is Mr. W. H. Radford, C.E., of Nottingham.

**LAVATORIES, &c., AT THE ANTWERP EXHIBITION.**—Finch's Siphonic Water Closet was selected by the committee for use in the public lavatories at Antwerp Exhibition, on account of their large water area in basin, and the rapidity of discharge. Messrs. Finch & Co. have also supplied and fixed the urinals and lavatories throughout the building, the work being done by English workmen.

#### FOREIGN AND COLONIAL.

**FRANCE.**—As many people expected, the competition for a design for the new postage stamp has resulted in a fiasco, the jury having rejected all the designs. After this decision, the Postal Department has renounced any intention of interfering with the present postage stamps.—The Académie des Beaux-Arts has been officially informed that an international competition is to be held—to be decided by an international jury—to raise a monument at Perugia. MM. Coutan, Cognot, Injalbert, Peynot, Lanson, and Saint-Marceaux are candidates for the chair at the Académie formerly filled by the late sculptor Cavalier.—An exhibition of the "Société des Miniaturistes et Enlumineurs de France" will be held in the Georges Petit Gallery from June 12 to 27.—The opening of the exhibition of works by Carpeaux will take place on the 20th at the Ecole des Beaux-Arts. The catalogue includes about 500 works, among which are many models of the celebrated group of "Le Danse." There will be a certain number of drawings also recording the fêtes given by the Imperial Court in 1867, on the occasion of the visits of crowned heads to the universal exhibition of that year.—The tubular railway works by Carpeaux is finished as far as the Place de la Sorbonne, under which is the "yard" for shunting. Ballast trains circulate already from one end to the other, under the Boulevard St. Michel, and the result of

the experiment so far is said to be satisfactory.—The Minister of Public Instruction opened last Sunday, at Poitiers, the new buildings erected for the Faculties of Literature, Science, and Art.—M. Dutert, architect of the Museum of Natural History, is at present engaged in erecting a new block of buildings in brick and iron, which will be adorned with sculptures by the most eminent animal sculptors of the day: MM. Froidet, Barrias, Marquette, J. Coutan, Gardet, Louis Noel, Engrand, Truffaut, Housin, and Lormier.—The Abbey of Mont St. Michel has hitherto retained its old tower which dates from the tenth century; but in view of the present dilapidated and dangerous state of this ancient building, there is talk of replacing it by a "modern Gothic" work.—The Art Exhibition at Tunis was opened on Saturday last.—On June 10 and following days the Archaeological Society of Sens will celebrate its fiftieth anniversary. Among the archaeological attractions of the programme are the public meetings which will be held in the ancient Synodal Hall, restored by Viollet-le-duc, and the hearing in the cathedral of an ancient piece of music revived according to a manuscript of the twelfth century.—The painter, Charles Jacques, has just died at Paris, at the age of eighty-one. He was born at Paris (1813) and commenced his studies as an engraver, but soon turned to *genre* painting. His talent was chiefly for rustic scenes and family interiors, and he became a recognised painter of country house interiors and domestic animals. As a painter he obtained medals at the Salons of 1861 and 1863, and a gold medal at the 1889 exhibition. Among his best-known works may be mentioned "Une Basse Cour," "La Sortie du Troupeau," "Grand Troupeau au Pâturage," "L'Abreuvoir," &c. Jacques, during his long and laborious career, was an ardent advocate of the art of etching and of original engraving by artists. He leaves two sons, both painters of talent.—The monument erected over the Marnes between Bonneuil and Saint-Maur-des-Fossés has just been completed. It will be opened on May 27.

**GERMANY.**—The executive committee of the 1896 Exhibition, in which the delegates of the Chamber of Commerce are now enrolled, has, after receiving the report of the "Site Commission" decided in favour of Lietzensee. The decision is endorsed by over two-thirds of the intending exhibitors from whom answers have been received, and will most probably be confirmed by the grand committee with whom rests the final settlement of the question. Charlottenburg has decided to double its original contribution of 7,500l., the whole dependent, of course, on the Lietzensee site being chosen.—The General Electric Company of Berlin intend to start, this summer, the building of a large central supply station on the Spree, just above Berlin, principally with a view to supply the Eastern industrial quarters.

—A new Asylum for Homeless Men is to be erected in the Wiesenstrasse at a cost of 20,000l. The Municipality will probably grant the land free of cost.—The proposed Electric Railway under the Spree, between Stralau and Treptow, will probably be continued as an electric tramway at either end terminating at the Oberbaum Bridge on the Stralau, and at the Gölitz Railway Station on the Treptow side.—A Thuringian Industrial Exhibition was recently opened at Erfurt.—A petition in favour of a canal from the Rhine to Niers, at a cost of 750,000l., is to be handed in to the Government.—The canalised Fildes is to be opened for traffic by April 1895.

The City of Munich intends to purchase the house which contains the Schack collection from the heirs of the deceased count, so as to obviate a removal of the art treasures.—The Bonn "Yearbook of the Society of Antiquaries" contains a description of the Roman mosaic flooring recently discovered at Creuznach, and now completely laid bare. The mosaics, which measure in all 64.45 by 72.35 metres, represent, for the most part, gladiatorial combats.—The recently-discovered wall paintings in the St. Peter's Church at Augsburg, which date from the year 1300, have been restored by Herr Lochner, the painter of the ceiling of the St. Max Church in that town.—Excavations recently undertaken on the Herapel, near Forbach, in Lorraine, where the foundations of a Roman Camp and of a Temple to Apollo were discovered in 1884, have resulted in the tracing of the Northern Tower and of a number of dwelling-houses. Numerous coins and architectural relics have been brought to light.

**ITALY.**—The Milan "United Exhibitions" were opened by the King on May 6. The exhibition consists of ten sections, and is completely a private venture of the citizens of Milan.

#### MISCELLANEOUS.

**STATUES, ST. MARY MAGDALENE, OXFORD.**—A series of statues have been placed in the new reredos at St. Mary Magdalene, Oxford. The reredos itself was designed and carried out under the immediate direction of Mr. Harry W. Moore, F.R.I.B.A., of Oxford. Acting under his suggestion the commission for the work of making occupants for the eight vacant niches was entrusted to Messrs. Harry Hems & Sons, of Exeter. The new statues are as follows:—

going from the north, (1) the Virgin Mary, veiled and bearing a lily; (2) St. Catherine crowned, with a sword in one hand and a martyr's palm in the other, at her side a fractured wheel; (3) St. Frideswide, in abbess attire, bearing a crozier and crowned; (4) St. Mary Magdalene, holding the oyster pot of repentance in her right hand; (5) St. George in armour, transfixing the dragon with a spear; (6) St. Hugh of Lincoln, dressed as a Carthusian monk, but coped, mitred, and holding a crozier; (7) St. Thomas of Canterbury, in full canonicals, bearing an archiepiscopal staff and with the mitre he wears cleft by a sword; and (8) St. Simon Stock, in the habit of a Carthusian monk.

**WATER SUPPLY OF CHERBOURG.** According to a recent report of the British Consul at Cherbourg the Municipal Council of that town, finding that there is no other available source capable of furnishing water in sufficient quantity than the river Divette from which the existing supply is derived, are about to purify the water of that stream by filtration. The river is tapped about half-a-mile from the town and the water pumped to a reservoir from whence it is distributed by gravitation to the houses. This system worked well for a very long period, but of late years the erection of houses, mills, and other works together with the increased use of manures, chiefly artificial, above the point where the supply is obtained, deteriorated the water to such an extent as to cause the recurrence of typhoid fever and other epidemics. Upon analysis the water was proved to contain organic matter and unwholesome germs in appreciable quantities. With the view of finding an efficient remedy, a committee of the Municipal Council proceeded to London for the purpose of investigating the systems of the great water companies. In consequence thereof it is probable that the system employed by the Chelsea Waterworks Company will be adopted at Cherbourg, but this requires consideration and time. Meanwhile, a temporary expedient has been carried out, by erecting a number of filters of the Maignen patent, each calculated to furnish 1,000 gallons of purified water per day in various parts of the town.

**THE SANITARY INSTITUTE.**—At an examination for Inspectors of Nuisances, held at Bristol on May 4 and 5, twenty candidates presented themselves. Questions were set to be answered in writing on the 4th, and the candidates were examined *visu et voce* on the 5th. The following eleven candidates were certified to be competent, as regards their sanitary knowledge, to discharge the duties of Inspectors of Nuisances:—Francis James Bruford, Manchester; Charles Cecil Broad, Malvern; William John Hughes, Ton Pentre; Albert Edward King, Bristol; George Hunter Macdonald, Bedford; Joseph Munro-Chick, Bridgewater; Gwilym Reed, Ton Pentre; Thomas Wells, Leicester; James Williams, Treherbert; John Williams, Aberillery; William Williams, Treherbert.

**REEREDOS, HOCKERILL TRAINING COLLEGE, BISHOP STORTFORD.**—The Bishop of St. Albans recently dedicated a new reredos in the chapel of Hockerill Training College for Schoolmistresses, Bishop Stortford. The reredos consists of a triptych, designed and decorated by Mr. E. Warren, architect. The frame is of wood, carved, painted, and gilded. The central panel is modelled in gesso by Mr. Conrad Dressler, sculptor, and represents the Crucifixion. The re-table is all wooden and painted. The whole of the woodwork is painted in the colour of the wood. When the triptych is completed the centre portion will be surmounted by three carved figures of angels, and the panels in the doors, which are temporary painted, will be replaced by panels bearing representations of saints or angels.

**ROYAL METEOROLOGICAL SOCIETY.**—At its monthly meeting of this Society on the 16th inst. at the Institution of Civil Engineers, Westminster, Mr. W. Marriott, F.R.Met.Soc., gave an account of a series of observations on the "Audibility of 'Big Ben' at West Norwood," which he carried on for a period of five years. The Clock Tower at Westminster is 5½ miles distant from the point of observation in a north-by-west direction. The observations were 976 in number, and were made at the hours of 9 a.m. and 9 p.m. They could be heard more frequently in the evening than in the morning, and on Sundays it was more frequently audible than on week days. The direction of the wind most favourable for hearing was between west and north. The observations were also discussed in relation to temperature, moisture, cloud, and barometric pressure.

**INDIAN MONUMENTS AND THEIR PRESERVATION.**—Our last issue we gave portions of an annual report of the Royal Institute of British Architects, including the Council's memorial to India Office on the subject of the preservation of Indian monuments. The extracts which we printed were taken from the draft report, which did not include the reply of the India Office to the memorial, which was as follows:—"Sir—I am honoured by the Secretary of State for India to the Council to acknowledge the receipt of your letter of the 19th ult., enclosing a memorial from the Council of the Royal Institute of British Architects regarding the classification and preservation of the Historical Monuments of India. In reply, I am to state the information of your Council that the subject



their memorial has for nearly fifty years engaged the attention of the Government of India. The archaeological survey of Upper India, by the late General Sir Alexander Cunningham, K.C.I.E., was sanctioned by them in 1861-62; and in 1870 they organised a department for the archaeological survey of the whole of British India, under the direction of General Cunningham, who remained at its head until his retirement in 1886, when it was reorganised on a plan submitted by General Cunningham himself to the Government of India. Again, in 1880 they sanctioned a special classificatory survey, to better provide for the protection, first of the monuments of Lahore, Delhi, and Agra, and afterwards of the whole of British India, appointing Captain (now Colonel) Henry Cole, R.E., to this duty, under the title of Curator of the Ancient Monuments of India; and when his survey was completed in 1888, the work of the conservation of these buildings was handed over to their natural guardians, the local authorities of the Provinces and Districts in which they are to be found. These arrangements are every year proving more and more satisfactory. The sum spent on the archaeological survey of India now amounts to about Rs. 6,000 a year; and an equal sum is spent on conservation, exclusive of the expenditure on the annual repair of historical buildings used for Government offices and other public purposes. In these circumstances the Secretary of State cannot undertake to suggest to the Government of India any modification of the existing arrangements. I am, however, to add that Mr. Fowler warmly appreciates the interest taken by your Council in the historical monuments of India, as evinced by their present memorial, a copy of which he will forward to the Government of India.—I am, Sir, your obedient servant, A. GODLEY.

### CAPITAL AND LABOUR.

**SETTLEMENT OF THE NORTH STAFFORDSHIRE BUILDING TRADE DISPUTE.**—A meeting of representatives of the North Staffordshire Master Builders' Association and of the Builders' Labourers' Society, was held at Hanley on the 9th inst., when the dispute in the local building trade was practically settled. It appears that the labourers sent in a notice for a rise of wages from 43d. to 53d. per hour, the notice to take effect on the 1st inst. The masters replied, pointing out that the custom of the trade was that notice of any alteration of rules or prices should be given on January 1 in each year, and as the notice in question had not been given it could not be entered upon. The men thereupon asked the masters to meet them in conference for the purpose of discussing the question. This request was acceded to and the meeting held as stated. After between two and three hours' discussion, the masters' representatives agreed to recommend to their association that they offer to the labourers a further per hour increase during November and December, and on January and February, the question as to whether this increase be continued during the months of March and April of next year being left over for decision at a meeting to be held in February. Mr. J. Ward, President of the Bricklayers' and General Labourers' Union, intimating that if the further per hour increase was agreed to, the men would be satisfied and the dispute would be at an end.

**CARPENTERS' AND JOINERS' DISPUTE.** ST. HELENS.—Mr. W. Powell, President of the St. Helens Master Builders' Association, on the 12th inst. received the award of his Honour Judge Collier, who sat as arbitrator in the dispute between the Carpenters' and Joiners' Societies of St. Helens and the Master Builders' Association. The alterations of the rules are as follow:—The arbitrator gives the men 43d. per hour advance. They asked for 44d. their wages will now be 83d. per hour. The men wanted the hours of work limited to fifty per week, or four less than they are at present working, and he is allowed. The weekly wage will now be 55s. 5d., as against 55s., or 7d. less, but four hours' work less. During the four months of winter the hours in the shop were forty-nine per week at the summer rate of wage of 8d. per hour, which was the old rate, making it 14. 12s. 8d. per week. He has altered that to 463 hours. The men must leave work at five o'clock at night instead of half-past seven o'clock. The men wanted the artificial light to be provided originally, the hours were 464 per week, at 4d. per hour more on outside jobs, now it is all uniform, both for work inside shops and on outside jobs—viz., 463 hours at the summer rate of wage, which will be 83d. per hour. He will not allow any alteration in the price of the work. The men wanted the limit to be the apprentice for four men, but that is not allowed. It is honour will allow nothing to be mentioned about machine-made joinery, this decision being in the following words: "I don't give effect to the rule about machine-made joinery." For alteration of rules, the six months' written notice is right, but it will expire on the first day of May in any year. In the case of the Joiners' Collier upsets the decision of the council Edward Johnson, Mayor of St. Helens in 1871, who was arbitrator in a dispute pending at that time. He allowed six months' notice to be given at any period.

### MEETINGS.

FRIDAY, MAY 18.

**Royal Institution.**—Professor A. M. Worthington, "The Splash of a Drop and Allied Phenomena," 9 p.m.

SATURDAY, MAY 19.

**Architectural Association Camera Club.**—Visit to Holy Trinity Church, Chelsea.

**Edinburgh Architectural Association.**—Visit to Dalzell House.

**Glasgow Architectural Association.**—Visit to Rothesay.

**Queen's College, Cork.**—Mr. Arthur Hill on "The History of Architecture." XVIII. 3 p.m.

MONDAY, MAY 21.

**Surveyors' Institution.**—Mr. T. W. Huskinson on "A Theory respecting the Primary Cause of the Depression in Trade and Agriculture." 8 p.m.

**Clerks of Works Association (Carpenters' Hall).**—Paper by Mr. F. J. Barnes. 8 p.m.

TUESDAY, MAY 22.

**Institution of Civil Engineers.**—(1) Mr. Andrew Brown, "Recent Types of Ferry Steamers." (2) Mr. Charles Jones, "The Birkenhead Ferry-Boats." 8 p.m.

**WEDNESDAY, MAY 23.**

**Carpenters' Company (Lectures on Carpentry and Joinery).**—Professor T. Roger Smith on "Framing and Construction of Partitions, Floors, and Temporary Structures." 8 p.m.

THURSDAY, MAY 24.

**Architectural Association (Great Marlborough-street).**—Mr. T. Stirling Lee on "Sculpture and its Relation to Architecture." 7 p.m.

**Royal Institution.**—Mr. W. M. Flinders Petrie on "Egyptian Architecture." I. 3 p.m.

**Society of Antiquaries.**—8.30 p.m.

**Institution of Electrical Engineers.**—Continuation of Discussion on the paper by Mr. R. E. Crompton, "M.I.E.E., on 'Cold' Electrical Energy." 8 p.m.

FRIDAY, MAY 25.

**Architectural Association.**—(1) Mr. Arthur Bolton on "The Practical Side of Travelling." (2) Election of Officers. 7.30 p.m.

SATURDAY, MAY 26.

**Queen's College, Cork.**—Mr. Arthur Hill on "The History of Architecture." XIX. 3 p.m.

### RECENT PATENTS:

#### ABSTRACTS OF SPECIFICATIONS.

**10,034.**—IMPROVEMENTS IN CLOSETS: *E. O. Poppe*.—The improvement which is the subject of this invention, consists in providing a valve between the pan or seat and the soil-pipe. This valve takes the place of the usual junction pipe between the soil or drain-pipe and the pan of the closet, and allows the water to pass closely shut off when the closet is not in use, so that no smell can escape therefrom into the room.

**10,044.**—FIREPROOF FLOORS, CEILINGS, &c.: *T. L. Banks*.—This invention relates to improvements in strengthening by iron rods or the wires ceilings or floors constructed with "expanded metal," i.e., sheet metal slit in such a way that when expanded the slits open out forming meshes or lattice-work.

**10,071.**—REMOVABLE SCAFFOLDING: *M. Kruse* (Copenhagen).—This is a platform rigid on a single pole or rail and moved up and down by ratchet work controlled by those on the platform.

**10,309.**—WATER-CLOSETS: *W. Oates and J. J. Green*.—The trap is removed from underneath the pedestal and placed in a suitable position beyond the pedestal, where it can be got at for cleaning purposes. Underneath the pedestal, in lieu of the trap, a pipe dish at the bottom is employed to receive and hold a given quantity of water, so that when the soil is deposited the pushing of the tipper will flush the dish or basin and so clear the matter contained therein.

**10,949.**—CHIMNEY-POTS, VENTILATORS, &c.: *W. H. Holt*.—The chimney-pot, which forms the subject of this invention, is provided with a circular passage, with its upper ends disposed on a level or above the top or outlet end of this centre passage, by which a screw or circular current of air will be produced to assist smoke or air to be readily drawn through the same, from whatever direction the wind is blowing.

**15,114.**—PAPER-HANGING MACHINES: *A. H. Lohrer*.—This is an elaborate piece of mechanism whereby the operation of trimming, pasting, and fixing the wall paper is performed by machinery instead of by hand.

**21,894.**—GOLLY-TRAP: *W. E. Fennell and another*.—This is a gully-trap, with a cleaning eye, in separate compartments, so constructed that the portion required to be cleaned by the general public (the receiver) is easily accessible, but the trap and drain portion is only accessible to men employed by sanitary departments.

**2,839.**—SASHES: *T. B. Brown*.—These are improvements in the mechanism for raising, lowering, balancing, resting in position the sashes of sliding windows, and locking and securing the same, and a method of reversing the sashes for cleaning, glazing, &c. Mechanical means to all these ends are described in the specification.

**3,869.**—ARTIFICIAL STONES: *J. D. Harris*.—One part by measure of Port and cement is mixed with three parts crushed stone, and formed into a wet mass by the addition of water; it is then placed in moulds until sufficiently dry to be taken out, and the surface is smoothed by means of a trowel, and then allowed to thoroughly dry, and rubbed down to bring into prominence its component parts. The surface is then brushed over with Portland cement in a fluid condition to fill in any inequalities or air-holes in the concrete. The artificial stone is varnished over with extra copal varnish, heated, and again polished.

**4,068.**—SASH WINDOWS: *A. Cope*.—A spring-actuated holder engages with the window-sash by means of a rack fixed thereon, but not so firmly but that the window can be raised and lowered.

**4,084.**—BLOWER VENTILATORS: *J. Fenne*.—A ventilator, blower fan for small localities and occupations, driven by spring-power, is so arranged that the number of revolutions of the fan may be varied as desired by means of a brake.

**8,469.**—CHIMNEY COWLS, OR EXTRACTORS: *J. Kirkman*.—An obliquely-fixed disc, and a T-shaped piece of

metal and frame are fitted to the pivot on which the cowl revolves. The effect of this addition is to increase the upward current or draught.

**8,837.**—WATER-CLOSETS: *J. Easby*.—A modification of the usual fittings for tanks. The weight of the valve instead of closing it. When the closet seat is pressed down it closes the valve and opens a tap which fills the tank with water; when the pressure is removed the weight opens the valve and shuts off the water.

**10,111.**—GASALERS: *J. N. Martin*.—The lamp shades are attached to chains passing through hollow bracket arms attached to the pulley frame. The chains are also attached to the weights or frame carrying the chandelier.

**10,227.**—FIREPROOF STRUCTURES: *T. L. Banks*.—**10,332.**—WOOD-BLOCK FLOORING: *W. Shepherd*.—A self-locking system of keying or bonding together wood-block flooring, each block having a tenon worked on the two ends, and on the two sides a grooved joint for the purpose of receiving the tenon. The floor is by this means laid firmly and evenly with a good bond.

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### NEW APPLICATIONS FOR LETTERS PATENT.

**APRIL 27.**—7,960, N. Talley, Saw Benches. 7,964, W. Purdy, Cranes. 7,982, W. Robb and others, Fireplaces. 8,003, W. Heywood and W. Curstone, Glazing and Roofing Buildings. 8,024, S. Holman, Heating and Ventilating. **APRIL 28.**—8,040, A. Clifford, Ventilators, Smoke Preventors for Chimney Pots, Soil-pipes, Ventilating Shafts for Drains, &c.—8,065, W. J. Leatherbarrow, Windows. 8,068, E. Howl, Kilns. 8,099, J. W. McLaughland, and Swivelling Windows. 8,108, G. Paine, Openings in Closing Greenhouse and other Sashes. 8,120, A. and F. Johnson, Water-closet. 8,139, F. Hoar, Fire Escapes. 8,141, G. Walker, Treating Fibrous Material for Ornamental or Decorative Purposes.

**APRIL 28.**—8,156, C. Hitchcock, Chimney Cows. 8,168, W. Baker, Ventilators. 8,177, S. Ashworth, Paint and Varnish Cans. 8,194, G. Srekey, Combined Saw and Planer. 8,199, E. Löwy, Facing and Paving Tiles, &c. 8,204, H. Barham, Chimney Pot and Draught Inducer. 8,213, W. Storne, Zinc-white Paints.

**APRIL 29.**—8,257, W. Ross, Syphons for Water-closets, &c. 8,260, A. Brown and R. Bari, Fireplaces. 8,283, F. Knight, Securing Roofing Slates. 8,297, A. Caine and H. Gilmor, Paint Compound and Pigment. 8,298, A. Caine and H. Gilmor, Paint Compound and Pigment. 8,301, R. Robson, Paint Strainers. 8,319, J. Stidder, Water-closets. 8,333, C. Bethell, Reversing Window Sashes.

**APRIL 27.**—8,335, C. and W. Batcock, Straightening and Setting Teeth of Saws. 8,345, E. and W. Heath, Mite Gramp. 8,351, G. Kirk and J. Harlow, Automatic Window-sash Fastener. 8,356, A. Downs, Invertible Window. 8,379, M. Gentry, Kilns. 8,393, I. Goldie and G. Hayman, Ventilators.

**APRIL 28.**—8,417, R. McDonald, Water-waste Preventers for Flushing. 8,418, J. Holt, Syphon Flushing Cisterns for Water-closets. 8,444, J. Brathwaite, Manhole and Ventilator for Sewage-pipes. 8,453, W. Conell, Regulating Fanlights and Skylights. 8,498, C. Jones, Water-closets.

**APRIL 30.**—8,501, A. Clifford, Flushing Cistern or Waste Water Preventer. 8,505, J. Tait, Pipe Coupling. 8,508, J. Mulligan, Chimney or Ventilating Caps. 8,540, R. Silverwood, Sliding Sashes or Windows. 8,541, R. Sione, Fireproof Plastic Material for Cement. 8,556, E. Stoessel, Electrically-operated Door-chain. 8,557, O. Doornik, Scoffings.

**MAY 1.**—8,577, J. Duckett & Son, Limited, and J. Duckett, Water-closets. 8,601, G. Goddard, Cutting or Trimming Wall-paper and other Materials. 8,623, H. Berger, Wood-planing Machines. 8,646, S. Lesem, Rock Drills.

**MAY 2.**—8,665, W. Jackson, Fanlight Openers. 8,693, G. Haywood, Ventilators. 8,713, E. Payne, Adjustable Ladder-brackets. 8,729, A. Lewin, Preventing the Closing of the Sashes of French Windows. 8,735, W. Palmer and W. Gibson, Cowl or Ventilator. 8,749, Z. Leroux, Windows.

**MAY 3.**—8,775, R. Bolton, Chimney-pots. 8,813, H. Foskett, Window-fasteners.

**MAY 4.**—8,853, W. Nicol Window-sash and Batten-rod



### CONTRACTS—Continued

## CONTRACTS—Continued.

PUBLIC APPOINTMENT

Those marked with an asterisk (\*) are advertised in this Number. Contracts, pp. iv., vi., and viii. Public Appointments, p. xxi. and xxli.

COMPLETE SPECIFICATIONS ACCEPTED.  
(Open to Opposition for Two Months.)  
10,483, J. Williams and W. Kemphorne, Metal Casements and Frames.—12,151, K. Knights, Bent Plates used for Bridges, Floors, Buildings, &c.—22,418, D. Buchanan, Deodorizing and Disinfecting Water-closets, &c.—7,974, W. Hyatt, Paint.—5,104, C. K. Ster, Veneers.—6,204, A. Leure, Frames for Stained Glass Windows.—6,671, 11 Arthur and C. Illingworth, Drainage.

ut. 41 yrs. *gr. 421. 9,500*; " *Th. Briars*,  
 Fassettsrd., Sur. litan. ut. 69 yrs. *gr. 701. 9,500*;  
 By C. F. Dousett: L.g.r. of 1501, Cambridge-gardens, Cr.  
 Notting Hill. ut. 69 yrs. *3501*; L.g.r. of 1001, 1501, 2501,  
 3501, 4501, 5501, 6501, 7501, 8501, 9501, 10501, 11501, 12501, 13501, 14501, 15501, 16501, 17501, 18501, 19501, 20501, 21501, 22501, 23501, 24501, 25501, 26501, 27501, 28501, 29501, 30501, 31501, 32501, 33501, 34501, 35501, 36501, 37501, 38501, 39501, 40501, 41501, 42501, 43501, 44501, 45501, 46501, 47501, 48501, 49501, 50501, 51501, 52501, 53501, 54501, 55501, 56501, 57501, 58501, 59501, 60501, 61501, 62501, 63501, 64501, 65501, 66501, 67501, 68501, 69501, 70501, 71501, 72501, 73501, 74501, 75501, 76501, 77501, 78501, 79501, 80501, 81501, 82501, 83501, 84501, 85501, 86501, 87501, 88501, 89501, 90501, 91501, 92501, 93501, 94501, 95501, 96501, 97501, 98501, 99501, 100501, 101501, 102501, 103501, 104501, 105501, 106501, 107501, 108501, 109501, 110501, 111501, 112501, 113501, 114501, 115501, 116501, 117501, 118501, 119501, 120501, 121501, 122501, 123501, 124501, 125501, 126501, 127501, 128501, 129501, 130501, 131501, 132501, 133501, 134501, 135501, 136501, 137501, 138501, 139501, 140501, 141501, 142501, 143501, 144501, 145501, 146501, 147501, 148501, 149501, 150501, 151501, 152501, 153501, 154501, 155501, 156501, 157501, 158501, 159501, 160501, 161501, 162501, 163501, 164501, 165501, 166501, 167501, 168501, 169501, 170501, 171501, 172501, 173501, 174501, 175501, 176501, 177501, 178501, 179501, 180501, 181501, 182501, 183501, 184501, 185501, 186501, 187501, 188501, 189501, 190501, 191501, 192501, 193501, 194501, 195501, 196501, 197501, 198501, 199501, 200501, 201501, 202501, 203501, 204501, 205501, 206501, 207501, 208501, 209501, 210501, 211501, 212501, 213501, 214501, 215501, 216501, 217501, 218501, 219501, 220501, 221501, 222501, 223501, 224501, 225501, 226501, 227501, 228501, 229501, 230501, 231501, 232501, 233501, 234501, 235501, 236501, 237501, 238501, 239501, 240501, 241501, 242501, 243501, 244501, 245501, 246501, 247501, 248501, 249501, 250501, 251501, 252501, 253501, 254501, 255501, 256501, 257501, 258501, 259501, 260501, 261501, 262501, 263501, 264501, 265501, 266501, 267501, 268501, 269501, 270501, 271501, 272501, 273501, 274501, 275501, 276501, 277501, 278501, 279501, 280501, 281501, 282501, 283501, 284501, 285501, 286501, 287501, 288501, 289501, 290501, 291501, 292501, 293501, 294501, 295501, 296501, 297501, 298501, 299501, 300501, 301501, 302501, 303501, 304501, 305501, 306501, 307501, 308501, 309501, 310501, 311501, 312501, 313501, 314501, 315501, 316501, 317501, 318501, 319501, 320501, 321501, 322501, 323501, 324501, 325501, 326501, 327501, 328501, 329501, 330501, 331501, 332501, 333501, 334501, 335501, 336501, 337501, 338501, 339501, 340501, 341501, 342501, 343501, 344501, 345501, 346501, 347501, 348501, 349501, 350501, 351501, 352501, 353501, 354501, 355501, 356501, 357501, 358501, 359501, 360501, 361501, 362501, 363501, 364501, 365501, 366501, 367501, 368501, 369501, 370501, 371501, 372501, 373501, 374501, 375501, 376501, 377501, 378501, 379501, 380501, 381501, 382501, 383501, 384501, 385501, 386501, 387501, 388501, 389501, 390501, 391501, 392501, 393501, 394501, 395501, 396501, 397501, 398501, 399501, 400501, 401501, 402501, 403501, 404501, 405501, 406501, 407501, 408501, 409501, 410501, 411501, 412501, 413501, 414501, 415501, 416501, 417501, 418501, 419501, 420501, 421501, 422501, 423501, 424501, 425501, 426501, 427501, 428501, 429501, 430501, 431501, 432501, 433501, 434501, 435501, 436501, 437501, 438501, 439501, 440501, 441501, 442501, 443501, 444501, 445501, 446501, 447501, 448501, 449501, 450501, 451501, 452501, 453501, 454501, 455501, 456501, 457501, 458501, 459501, 460501, 461501, 462501, 463501, 464501, 465501, 466501, 467501, 468501, 469501, 470501, 471501, 472501, 473501, 474501, 475501, 476501, 477501, 478501, 479501, 480501, 481501, 482501, 483501, 484501, 485501, 486501, 487501, 488501, 489501, 490501, 491501, 492501, 493501, 494501, 495501, 496501, 497501, 498501, 499501, 500501, 501501, 502501, 503501, 504501, 505501, 506501, 50

18, Courthill, Lewisham, ut. 72 yrs. *cf.* 64, *cf.* 302.  
2101, *s. 41*, Wyndford rd., Caledonian rd., and *cf.* 302.  
Thornhill Stages, ut. 72 yrs. *cf.* 302.  
2102, *s. 41*, St. Studley, *cf.* Forest Gate, 1, 540.  
44, 36, St. Stephen's rd., Bow, *cf.* 1061, 1, 540.  
2103, St. Stephen's rd., ut. 59 yrs. *cf.* 44, 44, 304; 94.  
Wenlock, Hoxton, ut. 48 yrs. *cf.* 44, 48, 321, 304.  
2104, *s. 41*, *cf.* 302, 304.  
2105, *s. 41*, *cf.* 302, 304.  
2106, *s. 41*, *cf.* 302, 304.  
2107, *s. 41*, *cf.* 302, 304.  
2108, *s. 41*, *cf.* 302, 304.  
2109, *s. 41*, *cf.* 302, 304.  
2110, *s. 41*, *cf.* 302, 304.  
2111, *s. 41*, *cf.* 302, 304.  
2112, *s. 41*, *cf.* 302, 304.  
2113, *s. 41*, *cf.* 302, 304.  
2114, *s. 41*, *cf.* 302, 304.  
2115, *s. 41*, *cf.* 302, 304.  
2116, *s. 41*, *cf.* 302, 304.  
2117, *s. 41*, *cf.* 302, 304.  
2118, *s. 41*, *cf.* 302, 304.  
2119, *s. 41*, *cf.* 302, 304.  
2120, *s. 41*, *cf.* 302, 304.  
2121, *s. 41*, *cf.* 302, 304.  
2122, *s. 41*, *cf.* 302, 304.  
2123, *s. 41*, *cf.* 302, 304.  
2124, *s. 41*, *cf.* 302, 304.  
2125, *s. 41*, *cf.* 302, 304.  
2126, *s. 41*, *cf.* 302, 304.  
2127, *s. 41*, *cf.* 302, 304.  
2128, *s. 41*, *cf.* 302, 304.  
2129, *s. 41*, *cf.* 302, 304.  
2130, *s. 41*, *cf.* 302, 304.  
2131, *s. 41*, *cf.* 302, 304.  
2132, *s. 41*, *cf.* 302, 304.  
2133, *s. 41*, *cf.* 302, 304.  
2134, *s. 41*, *cf.* 302, 304.  
2135, *s. 41*, *cf.* 302, 304.  
2136, *s. 41*, *cf.* 302, 304.  
2137, *s. 41*, *cf.* 302, 304.  
2138, *s. 41*, *cf.* 302, 304.  
2139, *s. 41*, *cf.* 302, 304.  
2140, *s. 41*, *cf.* 302, 304.  
2141, *s. 41*, *cf.* 302, 304.  
2142, *s. 41*, *cf.* 302, 304.  
2143, *s. 41*, *cf.* 302, 304.  
2144, *s. 41*, *cf.* 302, 304.  
2145, *s. 41*, *cf.* 302, 304.  
2146, *s. 41*, *cf.* 302, 304.  
2147, *s. 41*, *cf.* 302, 304.  
2148, *s. 41*, *cf.* 302, 304.  
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2169, *s. 41*, *cf.* 302, 304.  
2170, *s. 41*, *cf.* 302, 304.  
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2177, *s. 41*, *cf.* 302, 304.  
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2214, *s. 41*, *cf.* 302, 304.  
2215, *s. 41*, *cf.* 302, 304.  
2216, *s. 41*

[*Contractions used in these Lists.*—F.g.r. for freehold ground-rent; l.g.r. for leasehold ground-rent; i.g.r. for improved ground-rent; g.r. for ground-rent; r. for rent; f. for freehold; c. for copyhold; l. for leasehold; e.r. for estimated rental; u.t. for unexpired term; p.a. for per annum; yrs. for years; st. for street; rd. for road; sq. for square; pl. for place; ter. for terrace cres. for crescent vd. for yard, &c.]

## ESTATE EXCHANGE REPORT

MAY 3.—By *W. Bradly* (at Woolwich): 11 to 17 odd  
Glenside-rd., Plumstead, f., 570' By *Fuller, Moon, &  
Fuller* (at Croydon): 34 to 36, Farnley-rd., Norwood  
u.t. 85 yrs., g.r. 144, 560'; 34 to 37, Oval-rd., Croydon  
u.t. 80 yrs., g.r. 121, 840'

ut. 72 yrs., g.r. 61, 6750. *Swelling*: The lvs., silicles  
 ut. 75 yrs., g.r. 60, 8301. No. 14, Hornsey-rd.,  
 45. *Swelling*: The lvs., silicles. By Eastman Bros.  
 "Northfield" and "Southfield," Tewsbury-rd., Sydenham  
 ut. 75 yrs., g.r. 121, 7601. By Dunn & Soman; 34,  
 Norfolk-rd., Dalston. ut. 67 yrs., g.r. 121, r. 701, 6001.  
 By A. Richards: F.g.r. of 121 nos., Commercial-pk.  
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 Hall-rd., ditto in 84 yrs., 7401; f.g.r. of 1871 nos. at  
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 Beaconsfield-rd., ditto in 84 yrs., 1871. f.g.r. of 751 4s.  
 and plot of land, Temple Mills, Stroud.

MAY 8.—By *Brown & West*: 2, Canterbury, 250; 3, Kilburn, ut. 65 yrs. gr. 101, r. 521, 450;—By *Henderson & Latchford*: 48, Jeffrey-st., Clapham, ut. 66 yrs. gr. 61, 308; 8, 9, Listowel-st., Brixton, ut. 67 yrs. gr. 9, r. 654, 395; 14, 16, 18, Roundell-st., Wandsworth, ut. 68 yrs. gr. 138, 138, 138;—By *Chew*: 7, Emerald-st., Hammersmith, Cambridge Plk., Wandsw., r. 100, 100;—By *Chew*: 18, Beoth: 18, York-rd., Camden-rd., ut. 69 yrs. gr. 10, r. 954, 1,300; 4 to 10 (even), Hampshire-st., ut. 53 yrs. gr. 211, 506; 1, Tabley-rd., Holloway, ut. 72 yrs. gr. 71, 300; 459, 461, and 463, Caledonian-rd., ut. 78 yrs. gr. 571, 3,501; 467, Caledonian-rd., ut. 78 yrs. gr. 18, 18;—By *Dr. Davidson*: 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35, 36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53, 54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71, 72, 73, 74, 75, 76, 77, 78, 79, 80, 81, 82, 83, 84, 85, 86, 87, 88, 89, 90, 91, 92, 93, 94, 95, 96, 97, 98, 99, 100, 101, 102, 103, 104, 105, 106, 107, 108, 109, 110, 111, 112, 113, 114, 115, 116, 117, 118, 119, 120, 121, 122, 123, 124, 125, 126, 127, 128, 129, 130, 131, 132, 133, 134, 135, 136, 137, 138, 139, 140, 141, 142, 143, 144, 145, 146, 147, 148, 149, 150, 151, 152, 153, 154, 155, 156, 157, 158, 159, 160, 161, 162, 163, 164, 165, 166, 167, 168, 169, 170, 171, 172, 173, 174, 175, 176, 177, 178, 179, 180, 181, 182, 183, 184, 185, 186, 187, 188, 189, 190, 191, 192, 193, 194, 195, 196, 197, 198, 199, 200, 201, 202, 203, 204, 205, 206, 207, 208, 209, 210, 211, 212, 213, 214, 215, 216, 217, 218, 219, 220, 221, 222, 223, 224, 225, 226, 227, 228, 229, 230, 231, 232, 233, 234, 235, 236, 237, 238, 239, 240, 241, 242, 243, 244, 245, 246, 247, 248, 249, 250, 251, 252, 253, 254, 255, 256, 257, 258, 259, 260, 261, 262, 263, 264, 265, 266, 267, 268, 269, 270, 271, 272, 273, 274, 275, 276, 277, 278, 279, 280, 281, 282, 283, 284, 285, 286, 287, 288, 289, 290, 291, 292, 293, 294, 295, 296, 297, 298, 299, 300, 301, 302, 303, 304, 305, 306, 307, 308, 309, 310, 311, 312, 313, 314, 315, 316, 317, 318, 319, 320, 321, 322, 323, 324, 325, 326, 327, 328, 329, 330, 331, 332, 333, 334, 335, 336, 337, 338, 339, 340, 341, 342, 343, 344, 345, 346, 347, 348, 349, 350, 351, 352, 353, 354, 355, 356, 357, 358, 359, 360, 361, 362, 363, 364, 365, 366, 367, 368, 369, 370, 371, 372, 373, 374, 375, 376, 377, 378, 379, 380, 381, 382, 383, 384, 385, 386, 387, 388, 389, 390, 391, 392, 393, 394, 395, 396, 397, 398, 399, 400, 401, 402, 403, 404, 405, 406, 407, 408, 409, 410, 411, 412, 413, 414, 415, 416, 417, 418, 419, 420, 421, 422, 423, 424, 425, 426, 427, 428, 429, 430, 431, 432, 433, 434, 435, 436, 437, 438, 439, 440, 441, 442, 443, 444, 445, 446, 447, 448, 449, 450, 451, 452, 453, 454, 455, 456, 457, 458, 459, 460, 461, 462, 463, 464, 465, 466, 467, 468, 469, 470, 471, 472, 473, 474, 475, 476, 477, 478, 479, 480, 481, 482, 483, 484, 485, 486, 487, 488, 489, 490, 491, 492, 493, 494, 495, 496, 497, 498, 499, 500, 501, 502, 503, 504, 505, 506, 507, 508, 509, 510, 511, 512, 513, 514, 515, 516, 517, 518, 519, 520, 521, 522, 523, 524, 525, 526, 527, 528, 529, 530, 531, 532, 533, 534, 535, 536, 537, 538, 539, 540, 541, 542, 543, 544, 545, 546, 547, 548, 549, 550, 551, 552, 553, 554, 555, 556, 557, 558, 559, 560, 561, 562, 563, 564, 565, 566, 567, 568, 569, 570, 571, 572, 573, 574, 575, 576, 577, 578, 579, 580, 581, 582, 583, 584, 585, 586, 587, 588, 589, 590, 591, 592, 593, 594, 595, 596, 597, 598, 599, 600, 601, 602, 603, 604, 605, 606, 607, 608, 609, 610, 611, 612, 613, 614, 615, 616, 617, 618, 619, 620, 621, 622, 623, 624, 625, 626, 627, 628, 629, 630, 631, 632, 633, 634, 635, 636, 637, 638, 639, 640, 641, 642, 643, 644, 645, 646, 647, 648, 649, 650, 651, 652, 653, 654, 655, 656, 657, 658, 659, 660, 661, 662, 663, 664, 665, 666, 667, 668, 669, 670, 671, 672, 673, 674, 675, 676, 677, 678, 679, 680, 681, 682, 683, 684, 685, 686, 687, 688, 689, 690, 691, 692, 693, 694, 695, 696, 697, 698, 699, 700, 701, 702, 703, 704, 705, 706, 707, 708, 709, 710, 711, 712, 713, 714, 715, 716, 717, 718, 719, 720, 721, 722, 723, 724, 725, 726, 727, 728, 729, 730, 731, 732, 733, 734, 735, 736, 737, 738, 739, 740, 741, 742, 743, 744, 745, 746, 747, 748, 749, 750, 751, 752, 753, 754, 755, 756, 757, 758, 759, 760, 761, 76

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*Carpenters.*

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*Carpenters.*

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1. WARRIOR

## ILLUSTRATIONS.

New Cathedral for Berlin: Entrance Front.—Professor Raschdorff, Architect .....	Double-Page Ink-Photo.
Section of New Cathedral, Berlin.—Professor Raschdorff, Architect .....	Double-Page Ink-Photo.
Detail Elevation of Portion of Entrance Front, Berlin Cathedral.—Professor Raschdorff, Architect .....	Double-Page Photo-Litho.
Ground Plan, Berlin Cathedral.—Professor Raschdorff, Architect .....	Double-Page Photo-Litho.

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### Architectural Drawings at the Salon.

THE collection of designs in the architectural galleries of the Salon is of much the same kind as usual; the principal works being schemes of restoration, or imaginary designs, shown by drawings on a very large scale, with a comparatively small sprinkling of illustrations of executed works or commissions. The leading exhibitor is M. Chedanne, whose magnificent set of drawings of the Pantheon occupy one whole wall of a large room, and are sufficient in themselves to make a reputation, and should not be missed by any English architect who can find time for the visit. Merely as examples of architectural drawing of the first order they are worth attention. The drawings are described in the catalogue as "Étude sur le Panthéon de Rome, son état actuel, sa restauration par Septimé Sévère et Caracalla, en l'An 202." There is, of course, a complete set of geometrical drawings of the building as existing, with details of capitals to a large scale, and there is M. Chedanne's idea of the appearance of the building at the close of the second century. His exterior elevation shows the building clothed in an outer skin of perfectly symmetrical jointed and slightly rusticated masonry—the joints just channelled with a shallow sinking; this is intended probably for marble, which we may presume to have been torn off and pillaged, or perhaps to have partially dropped off in the course of centuries, leaving visible the present wall with its constructively rather incomprehensible arches. The upper portion, above the string-course which cuts into the rake of the pediment, is shown with a small order of pilasters; whether any trace of the existence of these has actually been found there is nothing to show. The section of the interior shows the lower stage of the design much as at present, except that a colossal nude figure of Jupiter occupies the space where the altar now stands. In the upper stage M. Chedanne shows an order of pilasters between the square-headed arches, in place of the existing panelling, and the dome is shown completely gilded and with large rosettes in the coffer panels. The most remarkable drawing of the whole is the perspective section showing the construction, which is a marvel of labour and ingenuity in draughtsmanship, and which, after the author's careful studies, and ex-

ceptional opportunities of examining the building, we presume may probably be accepted as a correct representation of the facts.

The next largest and most striking set of drawings is that by M. Max Doumic, illustrating a design for "Une Église de Pèlerinage." The style is a kind of modernised Byzantine, with a certain degree of Saracenic feeling in some of the details and ornament, notably in the surface decoration of the pediment and upper portion of the west front; a decoration which we may observe is far too large in its parts and quite out of scale with the building generally. The plan is nearly that of a basilica church, only that the arcade stops short of the apse, ending against massive piers, between which and the apse is a square area with a baldachino in the centre of it, supposed no doubt to contain the sacred objects or the pilgrimage. The section shows an enormous half-length figure of Christ in the semi-dome of the apse, as large as can be got into the space, and which inevitably dwarfs the whole building; a figure which is a concession to tradition, rather than to art. The drawings are splendidly executed, and fill a great space on the walls; but one can hardly say that the architectural result is commensurate with the labour bestowed on illustrating it.

We may pass from this to notice some other ecclesiastical designs. Among these is MM. Adrien Rey and Tronchet's set of drawings for a "Projet de Sacristie" for a grand cathedral; obviously an "École" competition design, in a style having some relation to our Jacobean; a semi-Classical work with a strongly-marked cornice and a balustrade with a riot of finials and twirling ornaments on the top of it. The design, very clever and elaborated with the greatest care, seems to show that architectural dignity and reticence are not among the qualities promoted by the École competitions; and one is confirmed in this idea by another study for the same subject by M. Selmersheim, which is in a rather less riotous and (from our point of view) more ecclesiastical style, but is a building we should be very sorry to see executed. A much finer piece of religious architecture is M. Hannotin's "Projet de Couvent dans l'Atlas, pour les Pères Blancs." Externally, this is a stern fortress-like building set on a rock, with one side descending, strongly buttressed, down the slope; the most remarkable drawing is the longitudinal section of the church, in which the author has shown how it is possible to make a mere geometrical section drawing poetically impressive. The drawing shows a

dark sombre church lit by small grated windows high up on the walls; three bays of large plain pointed arches with wide piers between; the walls are covered with mosaics on gilt ground, which, however, is treated so as to convey the impression of a dim church in which the mosaic and gilding are half lost and seen in occasional glints. Under or opposite each arch, in the aisle, is seen a sarcophagus with a recumbent figure. The remarkable point about this drawing is that it produces all the effect of a pictorial representation, from the powerful manner in which the light and shadow effect are shown; and the whole is a very fine though gloomy architectural conception.

M. Emile Dupont exhibits a restoration of the church of Santeuil, of which the actual state is not given (an unusual omission in a French set of drawings); it is a plain Romanesque church with an unusual plan; a short choir, a transept without any aisles, and square eastern chapels opening out of the transepts in the angle of transept and choir. M. Henri Deverin shows the actual state and restoration of the church of Airvault, a later church with some interesting details; the architect shows as part of the restoration an immense tower and spire, or the commencement of one, for its full height is too great for any of the sheets to contain it; it must be architecturally much too large for the church, if ever erected. Among designs for modern churches is M. Perouse de Montclos' "Église avec Presbytère pour le Village de Terre-Basse," a curious design in an exceedingly heavy modern Romanesque style, the low square piers of the nave arcade being actually wider than their height. There is a certain original power about this design; where it fails to an English eye is in the want of refinement in detail. This seems to be the prevailing shortcoming of all modern French design based on Gothic forms of architecture; in the very land and cradle of Gothic architecture the feeling for it seems to have quite gone out; French Classic detail of the present day is generally good, Gothic detail hardly ever. The only other ecclesiastical drawing we need mention is a very remarkable one, such a drawing as one would see nowhere but in a French exhibition; it is a very large construction perspective, showing at once the plan of one side, the section of the other side, and half the exterior façade, of the ancient church of Saint-Nicaise at Reims; the whole in elaborately finished perspective shown with such realistic force that at a little distance it looks almost like a model rather than a drawing. It is the work of M. Lepage, of Reims, and is the property of the



Corporation of that architecturally-renowned city.

As might have been expected, the competition designs for the Opéra Comique occupy some space on the walls. The design by MM. Henry and Massa shows a pleasing quietly-treated Classic façade, one of the best though one of the least pretentious of the designs exhibited. That by MM. C. F. and E. Saint-Père is in the best style of French gingerbread. M. Esnault-Pelterie exhibits a design with a dignified columnar front with good detail, the side elevation too like a warehouse in character, and weighted by a large overhanging corbelled-out turret on each side, continued the whole way up the building from the top of the grand story, with very unhappy effect; owing to the way the corbelling-out is treated, it looks just as if its foundations had been cut away. Most of the designs fail relatively in the treatment of the flank of the building, which is in almost all of them tame and uninteresting, though many of the front façades are well and effectively designed; that by Mr. G. M. L. Morice is one of the best; and another good one is that by MM. Adrien Rey and Tronchet, authors of one of the "Sacristie" designs above mentioned, and who again show themselves in secular architecture far more proficient (from our possibly "insular" point of view) than in ecclesiastical architecture.

A recent competition for the Hôtel de Ville at Ivry also adds its quota to the exhibition. Among these the design by MM. Chaise and Morin-Goustiaux is a good one, that by M. Masson-Detourbet a better, a fine and impressive Classic façade, notable for its breadth and unity of treatment, and the satisfactory manner in which the whole hangs together. Among the other designs for the same building are one or two curious and glaring mistakes in design; a good façade by M. Armand Lequeux is spoiled in effect by the three lumps of pyramidal roof coming down on the cornice, in a row, as if there had been a continuous roof, and two great notches had been cut out of it; and another design by M. E. Delestre, also a very well-designed façade in the main, is all but ruined by the preposterously tall turret rising off the ridge of the roof, and which has an appearance of absolute insecurity, besides being utterly out of proportion; it looks like a fleche run mad.\*

Among the various "projets" exhibited is one for a model theatre, said to be "after the indications of Grétry and Wagner," but the latter is not altogether correct, as part of Wagner's principle was to keep the auditorium in a plain and severe style, in order to give the greater effect to the stage scenery. The plan of the auditorium is an ellipse, with a domical ceiling (not a good form for sound), covered by an exterior constructional dome of iron, which is very ugly in its outline and decoration; there are some good points in the planning of the house, but the whole cannot be considered as a model for a theatre. The design by M. Rives for buildings for the 1900 exhibition is of some interest, but is only shown in a rather slight perspective view. The author encloses an immense oblong space parallel with the Seine, with special pavilions at the angles, and a cross centre block from which double wings project each way towards the extremities of the site, leaving a large garden area between them on each side of the centre. The grouping would be dignified externally, but as a form of plan it rather wants concentration, for convenience of circulation. M. Pille exhibits an interesting set of drawings of the "Galerie Dorée" of the Bank of France, a sumptuous room in Louis Quinze style, divided into bays by very

large windows the whole height of the room; a number of large-scale detail drawings are also given. With this may be compared the set of drawings shown by MM. Henri Michel and Parmentier, of the "Bibliothèque des Jésuites" at Reims, now the linen-room of the Hospital. This must be regarded we presume as a "restoration" work; it shows, in a fine set of geometrical drawings to rather a small scale, a beautiful long low room with finely-carved pilasters and cove decorations, lighted by tall windows placed in deep recesses, which are also top-lighted. As a library design it is worth study.

Among the designs for public buildings exhibited are some large plans and elevations for schools and buildings of similar type, which are in general very well considered in planning and practical detail, and the designs of nearly all of which illustrate that unfortunate tendency among French architects, fostered no doubt by the wishes of the Government, to give to schools an exterior aspect more suggestive of prisons or hospitals. These designs seem the too appropriate expression of the rigidly laid-down regulations under which French schools are administered. Everything we believe is done to make this class of State buildings in France healthy and convenient for their purpose, but nothing to make them inviting, picturesque, and home-like, as school buildings surely should be. In England it is too frequently found that school buildings are deficient in their sanitary arrangements and planning, but in most cases the buildings are pleasant and inviting in appearance. In France a modern school suggests the idea of a vast education-mill, in which all the scholars are to be ground to the same pattern; and if we have something to learn from the French in the matter of construction, planning, and sanitation of schools, they might certainly take a lesson from us in regard to the architectural designing of schools; since even in our School Board schools, which are built under special regulations as to planning, we have contrived in general to avoid ugliness and a forbidding monotony of treatment. Among the school plans exhibited, that by M. Toudoire of the "Collège des Garçons" at Bone (Algeria) is an example of the method of subdivision employed in laying out the plan: the building, on an irregular site longer at one end than the other, is laid out with long blocks surrounding the site, connected by cross blocks each of which represents one section or division of the school, each having its own courtyard and playground shut in by the cross buildings from connexion with the others; the exterior buildings are mainly for enclosure, and contain open galleries connecting the staircases, which are placed opposite the ends of the cross blocks. One school of somewhat more interesting architectural treatment than the rest is M. Mongenot's "Théâtre et Ecole de Garçons" at Remiremont, in which the front elevation shows the theatre as a wing on one side of the site and the school block balancing it on the other, both being treated so as to balance in general mass and proportions, but the architectural treatment varied so as to give the contrasted expression for the two buildings, which are connected architecturally by a lofty grille forming one side of the quadrangle. In this case the architectural treatment is more interesting and has less of the mill about it than in most of the other school designs.

Among the designs for public buildings which have some special and noticeable character is the design (a "projet" only, we perceive,) by Mr. René Dupard for a "Poste Centrale de Sauvetage," on the coast of Brittany—a kind of "Royal Humane Society's" establishment, in fact—in which the architect has adopted a stern massive style of building which looks specially suitable for a place of refuge on a bleak sea-coast; a short square tower rises from the centre of the building, intended we presume as an observation tower and for

sending rockets from; the plan of the building, with a flat side towards the land and an octagon termination towards the sea, increases its bastion-like character. An enormous drawing of a "Projet de Parlement" by M. Belestha has a splendidly-arranged plan, in connexion with which the elevation only shows how little the author has understood how to make the best, architecturally, of the suggestions of his plan. M. Masson-Detourbet's "Ecole Commerciale pour le Chambre de Commerce de Paris," is a long low building with a good deal of character, treated with an order of plain stone pilasters at the principal points, alternating with a smaller order of brick pilasters, on a high subbase between. The cornice wants weight and scale, for the style of building, which otherwise is an original and in its own way an effective one. Another building of some special character is the "Ecole de Commerce et de Tissage," at Lyons, designed by M. Forgeot; a plain stone basement story with pilasters, and brick walls above, and a coloured frieze of floral design, to be executed either in tiles or mosaic. For architectural effect the building, which runs round the angle of a street, wants raising and accentuating at the angle; but in the main it is a very good example of suitable and simple architectural treatment of a utilitarian building. Among the larger designs exhibited are a set of sketch elevations and perspective view by M. Fivaz, for the buildings for the agricultural and industrial exhibition at Constantinople. This is an unusually good exhibition-building design. The general style of the buildings is Turkish; the plan and perspective show a large central group of buildings with a dome, from which six quadrant branches at each side, ending at each extremity with a square pavilion and dome, and opposite and across the ends of each quadrant lies a separate longer pavilion, also with a dome in the centre of its length. The space included within the quadrant arms is laid out as a garden. The whole, as shown in the perspective view, with plenty of coloured material introduced, makes a group of far more architectural beauty than one generally finds in buildings designed for industrial exhibitions.

The few designs for private houses are curiously characteristic of both the strength and the weakness (from the English point of view) of French architecture in regard to modern house design. For anything in the shape of a palace or mansion, where stateliness is an essential quality, one can always look for fine and effective treatment from French architects, especially in regard to plan and interior effect. These qualities are well illustrated in M. Parent's "Hôtel, No. 28, Quai de Billy." The plan is most effective. The carriage drive from the street into the private courtyard runs across one end of the site, at right-angles to the street; and from the centre of the drive, parallel with the street, a very wide central corridor or hall runs right up the centre of the house, rising by two or three steps half way, and leading to the main staircase at the end, communicating with the two wings of the house. This makes a most stately and effective entrance for a private town mansion where probably large entertainments are to be given, and where plenty of space can be devoted to stateliness of accessories. The front façade, it must be confessed, is somewhat tamely treated, being a great mass of rusticated stonework with simple moulded architraves to the windows, and depending for its effect largely on decorative wrought-iron balcony railings. Still it is dignified, unpretentious, and in good taste. What a contrast when we come to the modern French villa or "picturesque" country house, as exhibited for instance in the design labelled "Un Cottage," a kind of house which in England would be supposed to be the design of a speculating builder making rather more liberal use of his money than usual

\* All the two sets of competition drawings referred to are to be found in the gallery round the central hall. It is of no use to give the numbers, as the French system of cataloguing gives no clue to the order of the drawings. The drawings referred to as the most important are hung in the three separate architectural rooms; the remainder in the gallery.



and which seems the very acme of tawdriness. In M. Le Thorel's "Maison de Campagne à Garches," again, we have a house which indicates rusticity by the liberal use of random masonry, and which is not indeed tawdry, but is ugly to such a degree that one wonders how any private owner could condemn himself to live in such a dwelling. Such designs would be absolutely ridiculed in the Architectural Room at the Royal Academy, supposing they could ever have a chance of getting hung there. M. Delma's country house design, "Propriété de M. Eug. G—," is one of the best of its class, and is certainly less obnoxious in taste than most of the others; but we do not think any English architect would like to sign it. It is really a very curious phenomenon that in a country where there is such admirable feeling for architectural dignity in buildings on a large scale, there should be such an utter want of perception of the true meaning of the word "picturesque," a word which, though French in form, seems to represent an idea which at present is absolutely non-existent in France—at least in French architecture.

The exhibition includes some good sets of sketches and studies of existing buildings; among the best are "Études Renaissance" and "Fragment Etrusque," by M. Pontremoli, of the Villa Medicis; the latter, to which no other name is given, is a very curious elevation of a *palazzo* with a Corinthian order in the upper story in which the columns are alternately fluted straight and fluted spirally. M. Tournaire exhibits some drawings of Romanesque church fronts, and a large and very fine elevation of the Palazzo Vecchio at Florence. The late M. Bourmance's sketches from the neighbourhood of Tunis (to which he was sent on a Government "mission") are of considerable interest.

In the middle of one of the rooms is a model of a monument designed by M. Recoura (we know not whether to be executed or not) to the memory of M. Doudart de Lagrée, who was the first discoverer of the remains at Mekong. The monument is in the form of a pagoda in the barbaric Mekong style, with a bust of Lagrée on one face of the base, bas-reliefs on the two others, and on the fourth side the words of the spirited reply which he made to an offer of the Italian Government—"Je préférerais n'avoir point de position et rester pauvre, que de servir l'étranger"; words which represent the French patriotic fervour in its finest aspect, and are worth attention in a country where there seems more and more a tendency to sell everything to the highest bidder, no matter whether it is in the interests of one's own country or not. In another room is a second design for the same monument, in which a stele of more Classic outline, with a globe at the top, forms the main feature, the surface, however, being decorated with flat ornament of a character which suggests the country with which the monument is associated, without breaking the Classic lines of the stele; perhaps a better treatment in an architectural sense.

**CITY COMMISSION OF SEWERS.**—The chief question discussed at the meeting of this court, which took place at the Guildhall on Tuesday last, was a motion introduced by Mr. H. T. Carpenter for an application to Parliament to erect a crematorium at the cemetery at Ilford. The form of the motion was objected to by several members, who declined to be bound to carry out cremation at Ilford, before the question had been considered by the Sanitary Committee, and in the absence of any recommendation from that Committee. The motion was eventually accepted, with the omission of the words, "and take all necessary steps to carry out cremation," the Sanitary Committee to consider the question, and report before further action is taken.

**THE ALBERT PALACE MATERIALS.**—As will be seen from an advertisement which appears in this issue, Messrs. Horne, Son, & Eversfield, auctioneers, of Gresham-street, E.C., will sell by auction on the 29th inst., the materials of the Albert Palace and Connaught Hall, Battersea. The sale comprises a large quantity of wrought and cast-iron work, hot-water-piping, glass, flooring, &c.

## PORTLAND STONE.\*

THE QUARRIES.

IN describing the quarries of Portland we may at once state that it is impossible to refer in detail to the whole of them, for according to our observations there are at least a hundred. A quarry is defined in the island as a separate working, where a crane is established and a "company" of men engaged. In traversing these workings we made notes at certain points, collected samples, &c., from each bed, and all we shall now attempt is to give some account of the same, together with the results of our experiments on the physical and chemical properties of the samples obtained. The numbers of the quarries refer to those on the topographical map (fig. 1).

## No. 1.—Wakeham Quarries, near Easton.

Whitbed ..... 5 ft. 6 in.  
Basebed (two beds) 5 ft. 6 in. and 2 ft. 6 in.

## No. 2.—Bill Quarries, Portland Bill.

Roach (three beds) ..... 6 ft.  
Whitbed ..... 8 ft. 6 in.

The upper part of the Roach is much broken up. The shelly matter in the Whitbed is rather larger than in the average from that horizon, causing the material to be slightly coarser; but it is a durable stone. The Portland Bill itself forms an interesting study for the architectural student as it exhibits a fine section of the building stone beds from the Cap and Rubble to the Flinty series.

## No. 3.—Quarries at Weston.

These give a normal section of the various beds, which we may profitably illustrate (fig. 5).

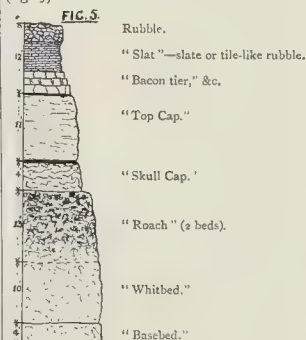


FIG. 5.—Vertical Section of Quarries at Weston.

## No. 4.—Waycroft Quarries.

These are long and sinuous, and we took sections at two points (a and b) as follows (omitting overburden):—

Point a—Roach 4 ft.; Whitbed 7 ft.  
Point b—Roach (upper bed) 4 ft.  
Whitbed (in three beds), separated by lines of flints—7 ft. 6 in., 2 ft., and 2 ft.  
One f. Curf 3 ft. 6 in.; Roach (lower bed) 9 in. bed. f. Basebed 6 ft.

In this quarry a large joint several inches in width runs from Cap to Basebed. The division between the Roach (upper) and Whitbed is sharply defined, the former being white and the latter grey on weathered surfaces.

## No. 5.—Mazgott Quarries.

Section essentially the same as at last quarries, point a.

## No. 6.—Grove Quarries.

These are mostly worked by convicts, and the stone has been very extensively employed in the construction of Portland Breakwater, &c. A glance is sufficient to show that these Government quarries are worked on a different principle to those belonging to private firms. The rubble and overburden, instead of being thrown behind as the face advances, is taken away some distance and mostly utilised. Consequently there is a vast clear-

\* Concluded from last week.

ing, which is kept in excellent order. Quarries worked by free men are intermingled with those exploited by the prisoners.

## No. 7.—Kingsbarrow Quarries.

A very large quantity of overburden has been removed in some parts of these quarries, and we anticipate an enormous production of stone at this point for some years to come. The section was as follows (fig. 6):—

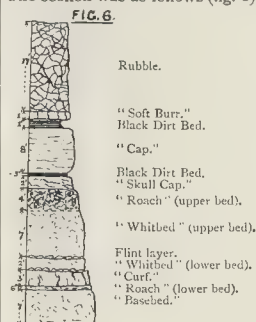


FIG. 6.—Vertical Section of Kingsbarrow Quarries.

It will be observed that the Whitbed contains two bands of flints, and that between it and the Basebed, Curf and a lower bed of Roach are developed.

## No. 8.—Inmosthay Quarries.

A large number of quarries are situated in this district. One gave us the following section of the workable beds:—

Roach (upper bed), 4 ft.  
Whitbed (in three divisions, separated by lines of flints), 4 ft., 3 ft. 6 in., and 3 ft. 6 in.  
Stone much broken up by flint, 2 ft.  
One f. Curf, 3 ft.; Roach (lower bed), 9 in. bed. f. Basebed, 8 ft.

## No. 9.—Inmosthay East Quarries.

Roach (upper bed), 6 ft.  
Whitbed, much broken up, stone rather coarse (in four beds), total 12 ft.  
One f. Curf, 3 ft.; Roach (lower bed), 6 in. bed. f. Basebed, 7 ft.

The Whitbed here does not seem to furnish quite the usual class of stone; the Basebed, however, is normal.

## No. 10.—Inmosthay Lower Quarries.

One bed. f. Roach (upper bed), 3 ft. 6 in.  
Whitbed (in two divisions, separated by a band of flints), 7 ft. and 2 ft. 6 in.  
Curf, 3 ft. 6 in.; Roach (lower bed), 1 ft. Basebed, 7 ft.

## No. 11.—Perry Quarries, Wakeham.

In this neighbourhood there are several workings. The Perry quarries are quite close to Bow and Arrow Castle. We took measurements at two points (a and b), some 200 yds. apart.

	Point a.	Point b.
	ft. in.	ft. in.
Roach	2 9	3 0
Whitbed (upper)	8 6	9 0
" (lower)	4 0	4 0

The Basebed is not worked in these quarries. At point a an enormous "gully" runs through the stone, at least 3 ft. in width, the sides of which are lined with aragonite and drooping stalactites. As will be observed, the Whitbed here is very thick, and we may add, the vertical joints are far apart, yielding stones up to 15 ft. or 16 ft. in length—probably the largest blocks in the island. It would appear also that where the "gullies" are large the blocks are generally very sound.

Descending now to the beach near the castle we have an excellent opportunity of examining the Flinty series of the Portlandian, on the way down. At this place also some fine views of a landscape are obtained.

## No. 12.—Toufield Quarries, near Yeales.

Roach, 3 ft. 9 in.  
Whitbed (in three divisions, separated by bands of flint), 2 ft. 9 in., 5 ft., and 2 ft. 6 in.  
Curf, 4 ft.  
Basebed, 7 ft.



The lowermost division of the Whitbed is not workable here; and it will be noticed that no lower bed of Roach exists. Other quarries are in the immediate vicinity.

No. 13.—*Tout Quarries, near Yeak's.*

These are situated near the edge of the cliff.

Roach, 4 ft.  
Whitbed (in two beds), 7 ft. 6 in., and 6 ft.  
Curf, 4 ft.  
Basebed, 6 ft. 6 in.

The lowermost Whitbed is not workable.

No. 14.—*Beare's West Side Quarries.*

Roach 5 ft.; Whitbed 7 ft.

At the time of our visit the Basebed was not visible, but we learn that it is occasionally worked.

own eyes and labelled on the spot. It is believed that the experiments are sufficiently numerous to warrant us in drawing up a general estimate of the relative value of the different kinds of Portland stone as a whole, and some of the conclusions arrived at are interesting and novel.

The following table gives the specific gravity of each stone tested, both in bulk and component particles; the weight per cubic foot when dry and when thoroughly saturated with water; also absorption per cent. of dry weight for periods from one second to one week. We attach considerable importance to the absorption experiments. The results of all samples dealt with are recorded, that is to say, they are not selected from a number to favour any particular theory:—

Experiments on some Physical Properties of Portland Stone.

No.	Name of Quarry.	Specific gravity.		Weight per cubic ft.		Absorption of water per cent.					
		True.	Partic.	Dry.	Wet.						
						1 sec.	1 min.	30 min.	1 day.	1 week.	
				lbs.	lbs.						
1	Wakeham	2.17	2.58	135.4	161.0	.85	2.74	5.61	6.78	7.21	
2	Bill	2.13	2.50	143.4	161.6	.75	1.70	.74	.50	4.19	
3	Weston	2.16	2.57	133.9	160.4	.252	5.59	.905	8.02	7.44	
7	Kingsbarrow	2.10	2.59	134.2	161.6	.133	1.74	.830	6.41	7.75	
10	Innothay Lower	2.16	2.55	143.5	160.0	.21	1.71	.475	4.85	4.85	
11	Perry	2.22	2.65	133.5	162.7	.143	4.1	.11	5.44	6.50	
12	Toutfield	2.11	2.62	142.0	161.5	.241	5.4	.670	7.55	8.24	
13	Toutfield	2.12	2.60	137.1	157.7	.130	5.6	.610	6.6	7.14	
14	West Side	2.17	2.54	145.4	158.5	1.30	5.99	5.99	6.40	6.81	
BASEBED.											
1	Wakeham	2.00	2.63	137.1	163.5	1.50	4.26	5.51	6.01	7.26	
3	Weston	2.09	2.59	130.4	161.6	.248	0.60	.721	7.71	9.20	
4	Waycroft	1.85	2.61	115.4	161.0	4.50	1.61	12.80	11.50	15.75	
7	Kingsbarrow	2.11	2.65	117.7	152.7	1.74	4.71	.78	4.8	8.57	
10	Innothay Lower	2.13	2.61	139.0	161.5	1.72	.650	6.00	8.12	8.62	
12	Toutfield	2.16	2.60	134.8	162.2	1.47	3.43	5.89	1.38	7.86	
13	Toutfield	2.17	2.60	135.4	160.1	1.37	3.43	5.74	6.40	7.35	
OTHER BEDS.											
1	Wakeham (Cap)	2.61	2.07	161.1	156.6	.4	4.47	.19	1.14	.33	
2	" (Skull Cap)	2.22	2.53	148.5	157.0	1.32	4.47	.401	3.68	5.53	
4	Waycroft (Roach)	2.31	2.59	144.1	161.6	1.16	2.58	.283	4.00	1.44	
10	Innothay (Curf)	2.63	2.61	150.4	161.1	2.58	6.71	8.30	9.06	9.73	
12	Toutfield (Roach)	2.15	2.45	134.2	152.9	.68	1.37	2.4	4.78	5.61	

Summarising the thickness of the beds in the Portland quarries, it appears that the thickest Whitbed, 10 ft., is found at Weston (No. 3); whilst the thickest Basebed is at Innothay (No. 8), where it is 8 ft. Beds from 7 ft. to 9 ft. are found at several places. The Roach is almost everywhere a massive bed.

Waycroft and Kingsbarrow are the original stone quarrying districts. The old "Bird's eye" Portland stone is not now obtainable, the quarries being worked out. This was raised at the northern end of the West Cliff, and the workings were known as Gosling's quarries. We ascertained also that the stone on the East Cliff is not now in the market, the reason being, we were informed, that it is so hard, and not economical in masonry. This seems to have some connexion with an observation in the "Guide to the Museum of Practical Geology" 4th ed. (p. 38) to the effect that "the quarries from which Sir Christopher Wren obtained the Portland stone which he employed, have long been deserted, the only reason assigned being that the merchants find they cannot sell that stone on account of its being a little harder, and thereby more expensive to work." If this is actually the case it clearly shows the unwholesomeness of modern competition. We may remark, however, that the Perry quarries (No. 11) and others in the immediate vicinity are not far from the East Cliff.

PHYSICAL PROPERTIES.

During our examination of the Portland quarries we collected 33 samples of stone. From these we have taken at random 21 specimens for testing certain physical properties of the material after the manner detailed in the articles now appearing in our "Student's Column." These are all representative samples detached *in situ* under our

Dealing first with specific gravity, we discover a very peculiar property of Portland stone not hitherto recognised. If the reader plots the true specific gravity of the Whitbed on a map of the island, so that each result is placed in the relative position occupied by each quarry referred to by number, he will notice that the Whitbed, having the lowest specific gravity (2.12), is found in the quarries in the north-west (viz., Tout), and that this increases in a south-easterly direction progressively—2.13, 2.16, 2.17, 2.22, until we arrive at the Perry quarries, where it reaches 2.30, the highest recorded specific gravity being at the Bill quarries, 2.33. In other words, the Whitbed when dry, in the north-west of the island, is lighter in weight (132.3 lbs. per cubic foot) than elsewhere, and it gets gradually heavier on proceeding in a south-easterly direction, the heaviest recorded weight being from the Bill quarries, 145.4 lbs. per cubic foot, at the southernmost extremity of Portland. Our experiments are too limited to enable us to state what change takes place in regard to the specific gravity of the stone in going from the east to the west of the island, but, speaking generally, the Whitbed on the eastern side is heavier than that on the western. The specific gravity of the Basebed is not so marked. It is higher (2.20) in the quarries in the centre of the island than elsewhere, and lowest (1.85) in those to the north-east. The average weight of the Basebed is less than that of the Whitbed—ranging from 115.4 to 137.3 lbs. per cubic foot. The specific gravity of the Roach, as far as we can show it, is 2.15 and 2.31, the heaviest Portland stone being the Cap (2.63), weighing 164.1 lbs. per cubic foot when dry.

The results of the absorption of water tests, so far as the Whitbed is concerned, are very instructive. We learn that the stone ab-

sorbing the most water in one week (8.84 p.c.) is situated in the north-west of the island, and in a measure the Whitbed becomes less absorptive as it recedes from that point in a south-easterly direction, coming down to 4.82 p.c. at the Bill. Thus we discover a close analogy between specific gravity and absorption, in the Whitbed; where the former is high the latter is low, and *vice versa*. The Basebed in the north-east of the island seems to be very absorptive, taking in as much as 15.75 per cent. of its bulk, in one quarry; this property also roughly follows the specific gravity results, in that where the Basebed is heaviest (Wakeham quarries) the amount of water absorbed is the least. The "time absorption" experiments give a good idea of the rapidity with which the various materials imbibe water—useful in connexion with the subject of dry walls.

The crushing weight of Portland stone has been ascertained on several occasions, and we have nothing new to offer on that head, though a series of experiments on the stone as now sent to the market is badly wanted. The majority of the results are very old, and refer to stone long since worked out. In the experiments carried out by the Institute, and recorded in the sessional papers for 1864, the mean resistance to crushing per square inch arrived at was, for 2-in. cubes, 2,576 lbs.; for 4-in. cubes, 4,099 lbs.; and for 6-in. cubes, 4,300 lbs. Kennie gives 3,729 lbs. per square inch; Barlow from 1,384 lbs. to 4,000 lbs. per square inch; Unwin, 299.95 tons to 516.38 tons per square foot (4-in. cubes); and Beare, for Whitbed, 173.5 tons to 229.0 tons per square foot, and for Basebed, 240.6 tons to 324.4 tons per square foot for the stone from one quarry, and 133.4 tons to 159.5 tons per square foot for that from another. Professor Beare's recorded strength of the Basebed—the first-mentioned result especially—must have been derived from very abnormal specimens, or the effects are inexplicable. There can be no doubt that the Whitbed is, on the whole, stronger than the Basebed. The Roach has been tested for fortification purposes by being fired at by heavy guns, when it stood the shock better even than blocks of Cornish granite.

CHEMICAL PROPERTIES.

Chemical analyses of various Portland stones show them to consist almost entirely of carbonate of lime, plus a little magnesia, silica, iron, &c. To be more precise we may give the following results:—(a) By Professors Daniell and Wheatstone; and (b) by Messrs. Ransome and Cooper, the latter referring to stone from the old Grove quarries.

	a.	b.
Carbonate of lime	95.16	96.18
" magnesia	1.20	1.05
" soda	—	.56
Peroxide of iron	0.50	.30
Alumina	—	.07
Silica	1.20	.91
Phosphoric acid	—	trace
Bitumen	—	trace
Water, &c.	1.14	.60

Messrs. Ransome and Cooper remark that the stone is readily decomposed by hydrochloric acid, the undissolved part consisting of silica in fine white grains. This analysis evidently refers to the Whitbed. From the general micro-structure of the latter, referred to, *ante*, p. 295, it is clear that a great part of the silica exists as quartzose sand grains, but partially also as the matrix when this is present.

WEATHERING PROPERTIES.

From the results of our experiments on the physical properties of the various Portland stones, it will be gathered that they must vary much in quality. Some of them, no doubt, are amongst the most durable freestones in the market, but others are by no means as satisfactory. We do not care to allude to each stone in detail under this heading, but the reader will probably be able to estimate its true value from what has already been said. Speaking generally, the



Whitbed is more durable than the Basebed, though from the nature of the latter in regard to facility of tooling, large quantities are sold. At the same time, we feel sure from the inferiority of the Whitbed in certain parts of the island, and to which we have not alluded in such strong terms as we should have liked to have done, that the better kinds of Basebed are superior to it in those localities but nowhere else. Where the stone becomes flinty it seems to weather very unequally. In large cities, Portland stone may generally be detected by the blanched appearance it presents on the weather side of a building. In some instances it is absolutely ghastly, and quite unfit for certain styles of architecture. Its grey tones when fresh, however, and the fact that, as a rule, it is much more durable than some other largely-used freestones we could name, will always cause it to be extensively employed, and rightly so. Large quantities of Roach are thrown away as rubbish; it is, however, a very durable stone, and for certain kinds of bold work the less vesicular classes could be used to advantage.

In certain localities, Portland stone becomes covered with lichens, &c., which feature has caused a lively discussion in our columns on at least one occasion, as to whether this promotes decay, or is indicative of superior durability. For our own part we do not think the time has yet arrived when this question can be clearly decided. On the one hand, it may be argued that if the stone "vegetates" it shows that its surface cannot be disintegrating very rapidly, or it would be removed before the lichens had time to take root. On the other, it may be contended that unless the surface does decompose there would be no encouragement to successful rooting, whilst the presence of vegetation must tend to keep the surface of the stone moist, and thus give more time for the operation of acids in attacking the carbonate of lime and perishing the material. Moreover, we know that some of the most powerful acids in existence, capable of doing this work, are derived from the decomposition of mosses and lichens. From our own observations we are able to state that certain lichens have an affinity for certain kinds of stone, and before the question can be fully resolved we must know which of these plants give rise to deleterious crenic and apocrenic acids, and which do not do so—for this has never been ascertained. An inquiry into the subject could not fail to shed considerable light on some of the more obscure problems connected with weathering, and in no case, possibly, would such an investigation prove more useful than in regard to the different varieties of Portland stone.

## NOTES.

It would be interesting to know what the English delegates, who attended the International Miners' Congress at Berlin last week, think of the opinion of M. Lamendin, who presided at the concluding sitting, and still more interesting to have the views of the British miners generally upon the French delegates' utterances. It is well known that the "friction" which invariably occurs at these gatherings was very pronounced on this occasion. Mr. Burt, it is true, makes light of it, and says that this somewhat unpleasant state of affairs is merely due to "inevitable misunderstandings," consequent upon so many different languages being spoken, and to the methods of procedure differing from those to which many of the delegates are accustomed. M. Lamendin, however, declared that the English always secured victory for their views, as they formed a majority; but that they were absolutely indifferent to the miseries of the miners on the Continent, because they did not experience them themselves. The economic conditions under which they lived were infinitely better than those

affecting the other nationalities represented at the Congress, and they congratulated themselves on their own position, and said, "We are comfortable." This really presents a very striking contrast to what the English miner was actually saying but a few short months ago. Certainly the German and Belgian representatives had just described the "miserable condition" of their working miners, while a delegate from Austria had declared that it was better to fight than to starve, and the British M.P.'s and others present could hardly follow in that strain. It is true, also, that some of the propositions which the English delegates declined to support were in the direction of unpromising Socialism; but one would think that they could not fail to perceive that their lot is really incomparably better than that of the men into whose hands they drove much of our coal business last year. The American miners are pursuing a similar suicidal policy just now, and the result will not improbably be disastrous to American industry generally.

THE managers of the London Board Schools have done good service by again calling attention to the subject of defective eyesight among the children of the Metropolis. We do not desire to touch on these remarks in regard to such points as the effect of needlemaking on eyesight; but the managers make some observations on the lighting of school-rooms, and they say "the gas-lighting is insufficient in many classrooms, three gas-burners in a central pendant being all that is provided." They suggest that there should be supplementary light from wall-brackets, and that the matter requires further attention. What is needed is a general investigation by competent persons into the lighting of the elementary schools all over the kingdom. Many of the paupers in the work-houses of England are there because from some physical defect, such as bad sight, they cannot earn their bread, and therefore sound eyes are not less important than sound education. To have sound eyes children must be educated in properly-lighted rooms, and we have no hesitation in saying that a large proportion of the schools of the country are defective in this respect. This remark is not confined to elementary schools: it applies equally to the public and private schools of a higher grade. The Education Department is responsible in the case of the elementary schools, and it is to be regretted that some Government supervision cannot take place of the sanitation and lighting of the higher schools.

MR. SELWYN IMAGE, in delivering a lecture on "Decorative Art in connexion with Elementary Education," before the Applied Art Section of the Society of Arts on Tuesday evening last, treated his subject generally rather than particularly. Though we thoroughly agree with his ideas and his means of disseminating them, there appears to be little probability of these views becoming immediately paramount, owing to the huge weight of apathy and ignorance with which the subject is regarded by the majority of the public. Mr. Image touched upon the great advantage to the community that would follow greater attention to decorative art, and the difficulty in arousing public opinion to the advantage of a training in line, colour, proportion, and the other principles of decorative art, and its cheering effect upon the life of those who are now surrounded with depressing ugliness. Bad ornament, which too often covers bad workmanship, on all sides exerts its influence to deaden the art instincts of the people, which, almost extinct at the present time, in the past flourished and pervaded both country and town life on all sides. The influence of surroundings was also dealt with by Mr. Image, who emphasised the importance of the cultivation of character, manners, breeding, taste, and an education lying beyond the acquisition of bare facts, which characterises the education of the

present-day Board Schools. Mr. Image's claim for more culture of the aesthetic sense, which exists in most children, though often in an entirely undeveloped state, should have wide sympathy. The means suggested by the lecturer referred almost entirely to the school buildings, and included a scheme for making not only the buildings architecturally beautiful without, but for increasing the beauty of the interiors of the class-rooms and assembly halls, by refining the design of the furniture, the decoration of the rooms, and the details of cornices and woodwork. Mr. Image's claim is for beautiful surroundings to develop the aesthetic taste in children attending elementary schools. No one can doubt the importance of Mr. Image's plea, but the practical suggestion is not likely to much impress the School Board, with its ever-increasing rates and angry ratepayers. The paper was followed by a discussion which, however, did not lead to any very practical suggestions.

THIS season is marked by the unusual number of large estates that are placed in the market. They include Dunecht, in Aberdeenshire, nearly 9,000 acres, famed for its timber, and the observatory erected there by the owner, the Earl of Crawford and Balcarres, hereditary chief of the ancient house of Lindsay; Heaton Park, the Earl of Wilton's seat near Manchester—its park, four miles in circumference, formerly known as the "Northern Goodwood," and its mansion, of white freestone, designed by James Wyatt, in 1772, for Sir Thomas Egerton, Bart., first Earl of Wilton. The view of the south front, in Neale's "Seats," shows a two-storied building having a semi-circular centre connected by corridors to two octagonal wings, the frieze of the central portion resting upon four Ionic columns, and crowned with a dome; the north front is more decorated, bearing a pediment carried by four Composite columns; in the ground floor are Venetian windows. This property belonged to the Hollands, *temp.* Anne. Elizabeth Holland brought it in marriage to Sir John Egerton, Bart., whose mother Bridget was sister and sole heir of Thomas (Grey), last Lord Grey de Wilton of that line, who died in the Tower, 1614. Gog-Magog Hills, the Duke of Leeds's seat in Cambridgeshire, originally a hunting-box, with training stables, of Lord Godolphin, is another which is to be sold; the house stands within the lines of Vandlebury, a Roman or British earthwork, one of the chain of forts that stretched from the Hunting Tower, by Audley End, in the Essex woodlands, to the Wicken and Upware fens at the north end of the Devil's Ditch.\* Other forts on the chain were at Littlebury and the walled town of Chesterford; to Vandlebury on the chalk range succeeded Grantchester, next stood Arbury. The Gog-Magogs are the pleasant hills of Balsham, in Henry of Huntingdon's phrase. If it be true, as Lysons says in his "Cambridgeshire," that Lord Godolphin destroyed a great part of the fort, which covered 13 acres, for his garden, there would seem some reason for associating the spot with the Vandals. Then we have Pishiobury, Hertfordshire, where, in 1782-4, James Wyatt designed the house for Jeremiah Milles, on the site of one built for Sir Walter Mildmay, and, *teste* Walpole's "Anecdotes of Painting," designed for him by Inigo Jones. The house, of three stories, has a central pediment, which, with the wings, is embattled—see the plate in Neale's "Seats." This property belonged to the de Mandevilles, Earls of Essex, in the eleventh century, and is separated from that county by the Stort. It subsequently passed to the Fitzgeralds, and from them to the Scroopes

\* The Ditch crosses Newmarket Heath, where it gives name to a spot well known to racing men; parallel with it lies a similar vallum, now called Fleam Dyke, where grows the *ancione pulsatilla*, or purple pulsatilla-flower, which is found, they say, only where Danes' blood has been shed.



of Bolton. Queen Elizabeth bestowed it upon Walter Mildmay, whose son, Thomas, sold it to Sir Lionel Cranfield (1612), afterwards Earl of Middlesex; it has passed through many hands since, belonging at one time to Lord Goran. John Bacon carved a mantelpiece for the drawing-room here.

At the meeting of the Egypt Exploration Fund on Wednesday, Sir John Fowler, who occupied the chair, whilst apparently condemning entirely the idea of submerging the Island of Philæ, on the other hand strongly supported what seems to us the preposterous notion of raising the island bodily. We call it preposterous, because we do not believe that any such thing can be done for any sum which is at all likely to be raised for it. Moreover, if done, it would still be an entire alteration of the site, and that it could be done without injury to any of the monuments we should think most improbable. Our own impression is that the proposal has never been intended seriously, but that it is a kind of blind to pacify that part of the public who are adverse to the destruction of Philæ, by a vague promise of a measure which is to satisfy both parties and allay opposition for the time.

In the *Times* of Saturday last was an article on "the disfigurement of Edinburgh," in which we heartily sympathise, calling attention in strong terms to the proposal to allow the North British Railway Company to build an enormous hotel on a site on the south side of Princes-street, between the North Bridge and Waverley Market, which is to be carried to the height of 80 ft. to the ceiling of the topmost room, and of course the roofs will rise considerably above this. The building height, generally, in Princes-street is restricted to 60 ft., so that such a building would be a complete monstrosity in relation to its surroundings, both in size and no doubt in style, for we all know what the railway hotel style is usually like. Edinburgh is a town so exceptional in its natural beauty of site, and which has on the whole been so little spoiled, that any proposal to injure the general aspect of its finest street is a matter of interest not only to the Edinburgh public but to the country at large. As the writer in the *Times* puts it, the mere fact that a railway company wish to turn hotelkeepers and to have as many rooms to let as possible on a given site, is surely no reason why they should be allowed, for the sake of their own pockets, to spoil one of the finest pieces of city scenery in the world. It is somewhat a novelty to find the *Times* so earnest on a question of this kind; but better late than never.

It is a significant sign of what we are to expect from the London water companies, which have shown every tendency to become more exacting since the unfortunate Report of the Royal Commission, that the Lambeth Water Company, under cover of a recent extraordinary judgment of Mr. Justice Chitty, are now taking up the position that water supply for a standing bath is not within the definition of "domestic supply," and are proceeding to cut off the water from premises where the owners have refused to pay the extra charge. It is difficult to know whether to feel more indignant against a water company which sets up such a claim, or against the law which supports it. At a time when the value and even necessity to health of copious ablution is becoming more and more widely recognised, and a bathroom is coming to be regarded rightly as a necessary adjunct even to a small dwelling house, the proposal to remove this from the category of "domestic water-supply" and hamper the use of it by a special charge, is one of the most monstrous proceedings we have heard of even in the annals of the London water companies. From a case which was brought into the Lambeth police-court last week it appears that the Lambeth Company have in a good many instances cut

off the whole supply of water from houses when the tenant refused to pay the extra charge for having a bath. How long is this kind of tyranny over the public to go on? Such a state of things in a city like London is perfectly disgraceful.

It is understood that the rector and churchwardens of St. George's, Hanover-square, with the concurrence of the Vestry, intend to apply for a faculty to make alterations in the church's interior, after plans already prepared by Sir Arthur Blomfield. These extend to a reseating of the church, the enlargement of the organ, and removal of a gallery, at an estimated cost of 3,000l. This church, often ascribed to Gibbs, was designed by James, and completed in 1724 for a parish, since divided, taken out of that of St. Martin-in-the-Fields. The interior was redecorated, and the lower windows enlarged, in 1871, by Mr. B. B. Sapwell, under the direction of Mr. B. Ferrey; Mackeson's "Guide" says that the organ, by Snetzler (1761), was rebuilt in 1864 by Hill. Hanover-square was plotted in 1717; eight years afterwards Sir Richard Grosvenor met his tenants and lessees in order to choose names for the streets and squares that had been laid out around Grosvenor-square. Many writers extol the view looking down George-street from Hanover-square; the houses, with their high and narrow windows, have elevations that are more like those of Italian cities than our own; Brown, in his "Domestic Architecture," directs attention to the beautiful brickwork of the house, a home of the Lords Palmerston, in the south-west angle of the square. In the church were married Sir W. Hamilton and Emma Harte, Lola Montes and Mr. Heald; on July 12, 1772, by licence, Thomas Holcroft, of St. Clement Danes, and Hannah Beck\*, the twelfth Earl of Derby and Eliza Farren, his second wife; and, on October 6, 1809, William Meeten to Lydia White, the celebrated "Blue-stocking." Five years ago the St. George's parochial ground, a strip of one-and-a-half acres lying between Mount-street and South-street, Mayfair, was thrown open for public recreation and enjoyment. A few days ago the Chancellor of London, sitting in the Consistory Court, assented to the granting of a faculty, under certain conditions, for the laying-out and general repair of a long-neglected graveyard, belonging also to this parish, situated on the north side of the Bayswater-road; see our columns of September 9, 1865. It extends over about five acres, and was formed, in 1764, by the then Tolmin's Farm. Here is the supposed grave of Sterne, to which we adverted in a "Note" on September 16 last year. The chapel has been lately rebuilt after the plans and designs of Mr. Herbert P. Horne, architect. The computed cost of this improvement will amount to 2,400l., and it is expected that as many as 2,000 tombstones, Sterne's excepted, will be shifted.

The summer exhibition at the Grafton Gallery under the title of "Fair Women," does not profess in the *apologia* of the directors to be an exhibition of portraits of "Fair Women" only. The title, therefore, may be dismissed as no more than an attractive bait to the Philistine, and setting this aside, we have an interesting and instructive collection of pictures, which, as illustrating portrait painting of different epochs and various schools from the Greco-Roman work of the second century to the present day possesses a distinctly educational value. To the artist and the art-lover the gathering together from many private galleries of examples of most of the great masters of portraiture, from Holbein and Botticelli through Rubens, Rembrandt, Kneller, Van Dyck, Lely, and others to the eighteenth century

masters and down to living painters, affords an opportunity of comparison which only considerable pains would otherwise render possible. To the Philistine, for whose shillings the organisers have displayed a shrewd commercial instinct, the exhibition of the counterfeit presentments of many notable women, of whom he has heard or read, some "possibly more celebrated for their historical interest, their influence, or their wit, than for their beauty," must prove an attraction, enhanced by the scraps of historical information with which the catalogue is garnished. A great part of the exhibition is, indeed, of literary rather than artistic interest, wherein is shown the financial acumen of the promoters, who have clearly felt themselves in no way bound to restrict their show by considerations of beauty in the subject, or of excellence in the craftsmanship of the pictures they have collected. Thus we find a considerable amount of dross in which the gems of the collection are encased. To the amateur of what, in popular estimation, are esteemed minor arts in comparison with picture painting, a genuine treat is afforded by the fine collection of miniatures, in which is included not only the work of men like Cosway and the Plimers, but of many lesser-known lights. Nor are the remarkable examples of fans contributed by the Marchioness of Bristol and others, or the capital specimens of various types of lace, from the stores of Mrs. Alfred Morrison and other collectors to be ignored, even although the cloven hoof of Commerce appears in the emphasis laid on the fact that one particular fan, a Japanese example of lacquer on ivory, has "only three others like it in the world, two of which are in the possession of the Mikado." Other instances of *bric-a-brac* in various items in the appanage of "Fair Women" are not without interest, either artistic or literary.

THE Carpeaux Exhibition at the École des Beaux-Arts is a little disappointing. One expected to see a considerable collection of the sculptures or models of one of the most gifted French sculptors of the modern period; whereas the proportion of casts is rather small and does not include any of Carpeaux' most celebrated works, and the numerous sketches and studies in pen, pencil, and colour are really too slight to have much interest, except that kind of interest which attaches to all autographs of an eminent artist. The colour sketches of some court functions during the Second Empire, from which a good deal was expected, are after all few and very rough—what French painters call "pochades"—mere rapid smudges to form a memorandum of an effect or an incident. There are some similar and larger sketches in oil of incidents in the siege of Paris, which are of interest as the impressions of an eyewitness at the moment. Among the casts are some small studies for the celebrated group of "The Dance," and two or three figures and ideal busts which illustrate Carpeaux' peculiar power of giving animated expression to sculpture, which he perhaps sometimes carried too far. The exhibition is one for artists who are visiting Paris just now to look in at, only they must not expect too much from it.

AMONG lesser exhibitions now open are two large pictures—both sacred subjects—on view at the Fine Art Society's Galleries. "Peace, be Still," by D. A. Wehrschmidt, and "Passing to Eternity," by A. E. Emslie. In colour they are in strong contrast, the former being very strong, the latter somewhat delicate in tone. Mr. Wehrschmidt, if he cannot be credited with a happy composition or a novelty in subject, has produced a picture which, no doubt, will appeal to many, and may prove, as many pictures do, more successful in mezzotint than in the original. Mr. Emslie's work is more elaborate in idea, and contains a large number of well-modelled figures. This also is to be reproduced by the Fine-Art Society.

\* Holcroft died, 12-9, in Clifton-street, and was buried in the Paddington-street ground; two and three-quarter acres, opened in July, 1886, at the joint expense of the Marylebone Vestry and the Metropolitan Public Gardens Association.



MR. HAMILTON AIDÉ'S water-colours at Messrs. Goupil's hardly, we think, merit the importance given to them as a "one man" exhibition. We cannot compliment him on his architecture or his colour in many instances, although the effect of atmosphere is well given in some of the pictures—notably in Nos. 7 and 12, two sketches in Cairo. Perhaps the best bit of colour and draughtsmanship is in No. 5, the Ruins of the Venetian Arsenal, Corfu. Many of the sketches are mere notes made during the course of much travel, and no doubt interesting to the traveller, but hardly of sufficient value to be placed in a public exhibition. The show would have been better if at least half of the pictures had been eliminated.

THERE seems to be some need for the schoolmaster to be more abroad among architects and surveyors. Deficiencies in grammatical construction (very frequent) are not peculiar to the writing of architects; many popular novelists can give them points in this respect. But one does rather expect professional men to know how to spell. A Surveyor to a Local Board writing about the good preservation of some work that "remains in tacked," an architect in large practice writing "centuary" for "century," another architect, of rather exceptional ability, calling attention in a competition report to the "symetry" of his design: these are surely indications that the Institute of Architects was not far wrong in establishing a general education test in its examination curriculum.

#### ARCHITECTURE AT THE ROYAL ACADEMY.—III.

At the north end of the gallery are grouped several important drawings of church work. Mr. Brewer's drawing of "The High Altar, Moosburg, Bavaria" (1,553) is a fine perspective sketch of a very elaborate piece of Late German Gothic, a shrine, rising into a forest of pinnacles and statues, standing on a narrow base corbelled out at the sides. Some of the detail is of course not in pure taste (from our English Gothic point of view), but the whole is a work well worth special illustration. Next to this is Mr. G. H. Fellowes' Prynne's perspective view from the north end of his remarkable church of All Saints, Dulwich (1,558), a drawing which was illustrated in our pages under date July 29, 1893; and which we have before commented on. It is a fine example of picturesque grouping arising naturally out of the special treatment of the plan. The interior of the "New Church of St. George, Worcester" (1,554), by Mr. Aston Webb, is shown in a cleanly-drawn pen perspective, giving the view of the chancel. It is a design mainly in Late Gothic style, but with some special character in the window tracery and other details. There is no chancel arch, the chancel is marked off by a battlemented roof-beam across the opening, with a kind of carved wreath of oval shape formed between the beam and the ceiling, within which are a cross and two figures of saints; we do not quite make out the detail of this "wreath," which seems to include some symbolic ornament; it looks a little heavy for its position. The chancel railing is a characteristic piece of design, consisting of a wrought-iron railing of much more Classic than Gothic appearance, supported by stone piers of simple but original design. The small plan added indicates a powerful and effective treatment of the west end, with the west window placed within what will evidently be a very deeply-recessed arch formed between the projection of the side porches. Below are hung two plain and business-like geometrical drawings of the east and west ends of Messrs. Brooks & Son's "Church of the Good Shepherd, Gospel Oak" (1,555, 1,556), examples of their well-known style of solid Gothic building, in which effect is sought for by the treatment of lines and masses rather than by ornamental detail. The treatment of the east end is rather peculiar, the lower portion having three separate lancet windows divided by substantial piers, the upper portion a grouped window of five lancet lights: a little too much repetition of the same form. The authors are to be commended for sending geometrical elevations, but we wish they would set a still better example by adding plans to them.

"P. & O. Offices, Leadenhall-street" (1,557), by Mr. Colcutt, is an admirable specimen of

geometrical drawing, illustrating an equally admirable piece of modern street architecture in a very refined style. It is more Classic than anything else in feeling, but is quite original, and the mouldings and all other details are very carefully drawn and considered. The ground story is treated with large circular windows, with moulded archivolts broken through at intervals by voussours accentuated by carved ornament on their face. In the spandrels of these windows are excellent bas-relief symbolical figures designed by Mr. Pegram, while below are a series of panels of historic representations of shipping, we presume intended for mosaic. The large carved ovolo moulding below the balustrade of the upper story is a good point, and tells all the more on account of the generally plain treatment of the front. Bands of a darker stone are introduced in parts, just sufficiently to break up the general light tone of the wall surface a little. Altogether a most satisfactory example of an architectural form to a business building.

Messrs. Ernest George & Peto have fewer exhibits than usual this year, the drawings of "Morning-room and Hall, Motcombe, Dorset," (1,561) and "New Wing to North Myms (1,562), forming the only representation of their works. The morning-room in the former design, completely wainscotted and with a ceiling decorated with an elaborate rib-and-panel design, has an appearance at once comfortable and dignified. The more robust treatment of the hall, with its heavy-timbered roof and bare stone walls partially hung with tapestry, is in effective and suitable contrast. No. 1,562 is in the authors' usual pleasing but rather archaeological style of exterior; we fully recognise, however, the amount of variety of character which they contrive to obtain in this style of house by very simple variations of treatment. Why, however, we may ask, disfigure the centre gable of this pleasing facade by an ostentatiously displayed rain-spout introducing a marked sloping line at variance with the architectural lines of the building?

"Bickley Hall Stables" (1,560), by Mr. Ernest Newton, shows some special character in the treatment of a stable building, to which in this case a certain breadth and dignity is given by the use of large semicircular windows, and additions of columns flanking the central arch under one of the buildings. We wish a plan had been added. Mr. Millard's "Addition to Wickham Hall" (1,563), a sensible-looking mansion design of no very marked character, also suffers from the want of a plan, which might have shown us whether the rather awkward manner in which a semi-octagon projection abuts against the side of the projecting wing really arises (as one may suppose probable) from the exigencies of plan in fitting a new piece on to an old house. As it is, one cannot form any judgment which is new and which is old.

The Memorial to the late C. W. Cope, R.A. (1,566), by Mr. J. W. Simpson, is a square-shaped stele with considerable entasis, carrying a square of modillion cornice, above which is a cross supported by two infantile figures or genii. As an example of a memorial, though simple, it is suitable and in very good taste.

"Design for a Frieze" (1,568) by Mr. Paton Wilson, is a good piece of colour; the elements of the design consist in animals running through a twine of foliage, which latter does not seem to us conventionalised sufficiently, with the result that the curves are broken and irregular and not sufficiently decorative in effect. The design of a similar class called the "Awakening of Spring" (1,584), by Mr. E. M. Atkins, which forms a pendant to it in the hanging, is more to our liking in this respect; it is also a design founded on natural forms, but the lines are kept cleaner and more symmetrical. A "Design for Stained Glass" by Mr. J. H. Newman (1,572) is a good bit of glass design of Renaissance feeling, with a squarely-treated border suited for a window of a mansion, and a centre panel occupied by two figures on a ground of floral design.

"New Houses, Gainsborough Gardens" (1,576), by Mr. Horace Field, is an example of simple and unpretending treatment of rather small street dwelling-houses, to which a certain dignity and unity is given by a rather strongly-marked cornice which runs along the front and round the two projecting bays, thus connecting the whole. The entirely plain masses of chimney-stack in the centre seem a little too heavy for the rest of the building; they would have been better for a little breaking up.

Of four designs by Mr. Basil Champneys which hang next each other, we prefer the "Pfeiffer Building at Newnham College" (1,580), illustrated in our last number, to which we may refer the reader. Besides its architectural interest as an important addition to Newnham College, the building forms a kind of monument to the lady who left the funds for it, and whom many who knew her will be glad to see commemorated in that way. Mr. Champneys' "Slindon Church, Staffordshire," (1,578), is a small church to which unusual dignity is given, in proportion to its size, by the massive low square tower which rises over the crossing. The battlemented finch of this tower, however, above the corbel-moulding, strikes us as rather out of scale with the other portions of the church; wanting a little more delicate treatment. The design by the same architect for "Reredos, S. Mary Star-of-the-Sea, Hastings," (1,577), is an elevation line drawing of a reredos in late Gothic style, with some special touches in the detail; the cresting has a rich and satisfactory effect.

Of the two houses shown in neat pencil drawings, by Mr. A. F. Vigers (1,581, 1,583) we prefer the "House at Beckenham," which has a good deal of quiet character, especially in the projecting portion in which the angles are treated in buttress form, with the window mouldings stopped against them. There is no plan to either. "Darlington Municipal Buildings," Competition design (1,587), by Mr. F. Pennington, is an elevation of what may be called good municipal Gothic style, in which some good effect is made by the varied treatment and grouping of the windows.

Mr. Robson's "Ashton Grammar School" (1,588) is shown in a very highly-finished pen drawing, with a small plan, not easy to see at the height at which the drawing is hung. If one could study the plan better it might be more easy to see the reason for the rather broken up and heterogeneous treatment of several portions of the exterior, which in the view do not seem sufficiently to belong to one another; it is not so much an emphasising of different portions by different treatment, as a treatment of them in what may almost be called different styles, and the result is that the whole wants unity, and seems a collection of several buildings rather than one whole.

"Birdseye-view from North-West of the New Monastery and Collegiate Buildings, St. Lawrence's, Ampleforth" (1,591), by Mr. Bernard Smith, gives the perspective view of this great establishment, the plan and elevation of which were published in the *Builder* for April 8, 1893. The tower and spire, which stand over the centre of the chapel, rise effectively from the midst of the large group of buildings, which are naturally (for an establishment of purely Mediaeval type) in a purely Mediaeval style. The chapel, in the nave and choir are of the same length and treatment on each side of the crossing, is apparently entered from the centre of one side opposite the tower, an unusual arrangement for which we presume there is some special reason.

"A Country Town Club" (1,580), by Mr. G. L. Morris, is a very unusual and characteristic little elevation, lined in by hand (without a ruler, that is to say), in lines of different colour, according to the material to be suggested. The design, of a simple and unpretending character, but sufficiently diversified in outline by the raised mass, with a flèche, at one point, and the little quai-campanile at the end, is exactly suited in expression for such a building as it represents, and the drawing presents also an interesting speciality in method of architectural drawing. A plan is added.

Mr. Selden Wornum's "The Library, Royal Residence, St. Sebastian" (1,590), a coloured elevation of the side of a room, presents nothing out of the way in design or treatment, but is entirely satisfactory in point of taste and harmony of colour in a subdued key.

Mr. F. A. Walters exhibits an exterior view of his "New Church, Dorling" (1,593), a very plain and solid church in Early English style, a very pleasing building of its type; and an interior very slightly sketched of his "Catholic Church, Bow Common" (1,594), in which a rather elaborate and effective rood-screen is the principal point of treatment; a drawing not quite up to its author's reputation as a church architect.

"Ashcroft; Garden Front" (1,595), by Mr. W. F. Unsworth, is a perspective drawing of an interesting example of what may be called the cottage type of country house. The large low gabled projections, two of them projecting at right-angles and the third obliquely from the principal front, the low walls and high-pitched roof, combine to give that kind of effect of a "nest" rather than a house which one finds sometimes in

\* This drawing was illustrated in the *Builder* for August 26, 1893.





Old House, Ifield, Sussex.—From a Drawing by Mr. E. B. Lamb.

rambling old country houses. There is no plan, which is to be regretted; it would be interesting to see how far the in-and-out design of the house works out conveniently on plan.

Mr. Leonard Stokes sends two designs, as usual marked by originality of treatment. "St. Augustine's Church, Sudbury" (1,596), has a solid square-looking end elevation to the nave, the fronting line only broken by a partial rise in the centre, parallel with a raking moulding which spans the whole wall a little below. This moulding cuts through some horizontal bands of light-coloured stone in a manner which is not quite satisfactory to the eye, as if it interlaced with them. The tower is banded in a similar manner in the upper portion, the *fond* of the walls being apparently brick: a small octagon lantern looks rather lost on the centre of flat roof of the tower. The same architect's "Nazareth Home, Bexhill" (1,597), is an excellent example of the utilitarian building just raised out of utilitarianism by a few touches of character. It is a large unbroken parallelogram of building, with a ground story in brick (?) with large nearly semi-circular windows having reference obviously to some special function of this story; above the walls are white, we presume cemented, with plain sash-windows and very widely-projecting eaves with a

flat soffit. Over the recessed entrance portion is an arched opening on similar lines to the ground floor windows, with a balustrade in front and two statues erected on it, standing out against the shadow formed by the recess in the rear. The spandrels of the arch are occupied by medallions in monograms. The design is an excellent study of what may be done by a few touches to relieve a building of this class from commonplace.

**PUBLIC WORKS IN SAN JOSÉ, COSTA RICA.**—According to a recent report of the British Consul at San José, many new residences are being erected in that town, which is extending in all directions, and roads levelled and macadamised. The new theatre, an imposing edifice, has made much progress, and is expected to be opened at the end of the year. Two large churches, chiefly of iron from Belgium—the one in San José to replace the church of "La Merced," and the other in the village of Grecia, to replace one seriously damaged by an earthquake—are being constructed. A large iron school-house, imported from Belgium, is being erected in the park of Mara Zan, and is nearing completion. The electric light is coming more into general use every day, both for public buildings and private dwellings. The telephone has been introduced and is in use in all the principal commercial houses, and will soon be extended to the provinces.

#### OLD HOUSE, IFIELD.

The author of this pretty sketch of a very picturesque bit of old building is not able to give us any special information about the house. He believes it is called "Ewehurst," and the sketch shows only a portion of the house, which is partly surrounded by a moat in which water still remains. The house is, as far as he remembers, all of one date. The drawing, though only recently sent to us, is from a sketch made some years ago, and Mr. Lamb has no further notes as to the history or details of the house.

**NINETEENTH CENTURY ART SOCIETY.**—To-day (Saturday) has been appointed for the private view of the Summer Exhibition (the thirty-second) of the 19th Century Art Society, at the Conduit-street Galleries, and the exhibition will open to the public on Monday next.

**FORESTERS' CONVALESCENT HOME, CLENT, WORCESTERSHIRE.**—A convalescent home for Foresters has just been opened at Clent. The building is built of red brick, relieved with stone dressings, and its cost has been about 2,000l. Mr. B. Corser, of Birmingham, was the architect, and Messrs. Guest & Son, of Stourbridge, the builders.







0 1 2 3 4 5 6 7 8 9 10 M

THE NEW CATHEDRAL  
SECTION ON LEFT



LESSON KASCHDORFF, ARCHITECT  
ALTAR (SEE PLAN).

THE PHOTOGRAPH BY A. C. & B. EAST HART AND L. HEY JETTER AND E. C.





## COMPETITIONS.

**SCHOOLS, LOWESTOFT.**—At a recent meeting of the Lowestoft School Board a report from the General Purposes Committee was read with reference to the competition for new schools near Church-road. Twenty-nine sets of plans were sent in, and Mr. J. Morris, of Reading, Architect and City Surveyor, was appointed assessor. The committee having made a careful inspection of the twenty-nine sets of plans sent in, considered that the three best were those bearing the mottoes "Star," "Merlin" and "Birch Rod," and placed them in the following order, viz.—1st, "Star"; 2nd, "Merlin"; 3rd, "Birch Rod"; 4th, "Merlin"; 5th, "Birch Rod"; 6th, "Merlin"; 7th, "Birch Rod"; 8th, "Merlin"; 9th, "Birch Rod"; 10th, "Merlin"; 11th, "Birch Rod"; 12th, "Merlin"; 13th, "Birch Rod"; 14th, "Merlin"; 15th, "Birch Rod"; 16th, "Merlin"; 17th, "Birch Rod"; 18th, "Merlin"; 19th, "Birch Rod"; 20th, "Merlin"; 21st, "Birch Rod"; 22nd, "Merlin"; 23rd, "Birch Rod"; 24th, "Merlin"; 25th, "Birch Rod"; 26th, "Merlin"; 27th, "Birch Rod"; 28th, "Merlin"; 29th, "Birch Rod." The committee recommended that the plans marked with the motto "Star" be adopted by the Board for the new school, and that Mr. W. Rushworth, of Adelphi, London, the author thereof, be appointed architect of the works. They also recommended that the premium of 10*l.* 10*s.* be paid to Mr. F. S. Silcock, of Bath, the author of the plans marked with the motto "Merlin," and that the premium of 5*l.* 5*s.* be paid to Mr. J. W. Stoubold, of Bloomsbury, London, W.C., the author of the plans marked with the motto "Birch Rod." The recommendations were agreed to.

**LONDONDERY BATHS AND WASH-HOUSES.** The Corporation of Londonderry have appointed Mr. William McElwae, M.R.I.A.I., of Londonderry, as professional referee to examine and report on the designs submitted in this competition.

**ELECTRICAL LIGHTING STATION FOR THE VESTRY OF ST. MARY, ISLINGTON.**—A limited number of architects were recently invited to submit designs in competition for the structural part of an electrical lighting station for Islington. These designs, distinguished by numbers only, were duly considered by the Electrical Lighting Committee of the Vestry on the 17th inst., and, acting upon the recommendations of Mr. Albert Gay, the electrical engineer to the Vestry, the design "No. 3" was formally adopted, and its author duly appointed architect to carry out the work. On the envelope accompanying this design being opened the name of the successful competitor was found to be Mr. A. Hessel Tiltman, F.R.I.B.A., 70, Torrington-square, W.C. The present plans (which form a first portion only of the future contemplated establishment) provides accommodation as follows:—Two boiler-houses, each 112 ft. by 56 ft., two dynamo and engine-rooms, each 112 ft. by 44 ft. Arc lighting plant room, 62 ft. by 40 ft., testing-room, oil and waste stores, general stores, switch room, machine and fitting-shop, smith shop, carpenters' shop, stokers' mess-room, cloak-room, &c., coal-store, water-tank for some 120,000 gallons, and offices for the departmental engineers and the general clerical staff. The estimated cost of this structural work of the first part of the scheme is about 20,000*l.*, and the work is to be immediately proceeded with.

**CLOCK TOWER, WESTON-SUPER-MARE.**—We are informed that the design by Mr. S. J. Wilde, architect, and submitted by Mr. W. E. Perrett, clock-maker, for the Pigott Memorial Clock Tower, to be erected on the sea front at Weston-super-Mare, was finally selected out of about fifteen sent in.

## ARCHITECTURAL SOCIETIES.

**EDINBURGH ARCHITECTURAL ASSOCIATION.**—The annual general meeting of the Edinburgh Architectural Association was held in the Royal Institution, Princes-street, Edinburgh, on the 16th inst. Mr. W. W. Robertson, President, in the chair. The following office-bearers were elected for the ensuing year:—President, Mr. W. W. Robertson; Past-President, Mr. John Kinross; Vice-Presidents, Dr. Anderson and Mr. Thomas Ross; Secretary, Mr. T. Fairbairn; and Librarian, Mr. Thomas Ross. The various committees were also arranged. The Chairman, in his valedictory address, reminded the members that in March the Council of the Association had waited upon the Edinburgh Town Council to urge two points:—(1) That the best architectural skill available should be conjoined with that of the engineer who might be invited to design the new North Bridge; (2) that in respect of the buildings at the north end of the bridge which the railway company proposed to rebuild, the

existing restrictions as to height should be maintained entire and undiminished. The deputation was most courteously received, and fondly hoped that it had so far impressed the Corporation that it views would be adopted. What might be the action of the Town Council as to the designing of the new North Bridge he did not yet know, but as to its action on the other point, he must confess to a feeling of profound disappointment. The present height of the higher portions of these buildings was about 55 ft., and the railway company proposed to take power to build the ceiling of the highest inhabited story 95 ft. above the level of the street. What the city had agreed to was a clause providing that the height should not exceed 80 ft. to the wall head without the consent of the Corporation. The difference between these two conditions was very much the difference between "Tweedledum and Tweedledee," and the concession secured by the town, which seemed little enough at first sight, was found on examination to be nearly altogether illusory. From Sir Walter Scott's Monument and Princes-street to the West, the proposed buildings would wipe out the view of the Calton Hill. Viewed from the Calton Hill, in the vicinity of Nelson's Monument, (whence one of the finest views of Edinburgh was obtained), the effect of such a building would be simply disastrous. It would block the view from the Castle Hill on the left to the Scott Monument on the right, and shut out the views of the valley as completely as if a huge shutter were drawn up. The building would also shut out of view the whole vertical portion of the outline of the Castle rock, in that way not only entirely destroying its characteristic appearance, but depriving it of half its apparent height. From nearer points of view—from the south looking down the North Bridge, and viewing it as part of the group surrounding the Register Office crossing, the effect was equally disastrous. He saw from the newspapers that one Town Councillor gave it as his opinion that the Committee of the House of Lords would not be likely to interfere with the Bill because the building would shut off the views of Princes-street gardens from the Calton Hill. Whether as representing a fact (if it did so) or as shadowing forth the state of mind of one of the guardians of the beauty and amenity of their "own romantic town," it would, in his mind, call forth very different emotions than the laughter with which it was received. Surely the beauty of Edinburgh was beyond price, and if her sons had that deep appreciation and affection for her which they ought, they would value those who tenderly sought to preserve it. For the actual action of the Town Council he could find many excuses. In the complex negotiations with the railway company, the Corporation had to give and take; and it was unfortunate from the architectural point of view, that there were other points to which that body attached more importance. The Bill had still to pass the House of Commons, and he would fain hope against hope that some amendment might then be made. Mr. James Brown, W.S., moved, and Mr. Thomas Bonar seconded a vote of thanks to Mr. Robertson, after which the proceedings terminated. A party of members of the Association visited the old Castle of Dalzell, the seat of Lord Hamilton, on the 19th inst. The original keep of the Castle probably dates from the fifteenth century, and was doubtless built by Dalzell of that ilk, a family in whose possession the barony had been for several generations till 1647, when it was acquired by James Hamilton, of Boggs, ancestor of the present proprietor. He made extensive additions of the Castle, and his arms and those of his wife, Jean Henderson (of the Fordell family), are still to be seen on the house, with the date 1649. The present Lord Hamilton greatly added to the structure about 1847. The late Mr. Billings, the author of "The Baronial Antiquities of Scotland," was the architect employed. The party next walked to Jervisfoot House, about a mile distant from Dalzell. This is an ancient seat of the Baillie family, and overlooks the Clyde not far from Motherwell.

**GLASGOW AND WEST OF SCOTLAND TECHNICAL COLLEGE.**—The opening lecture of the Architectural Summer Measuring and Sketching Class of the Glasgow and West of Scotland Technical College, on "The Value to the Architect of Sketching and Measuring Old Buildings and hints on how to do so," was delivered on the 7th inst. in the Architectural Studio, 204, George-street, by the lecturer, Mr. Charles Gourlay, A.R.I.B.A. and I.A. The first class at the Cathedral was held on Saturday, 12th inst., under the lecturer and the instructor in the studio, Mr. James Lochhead, A.R.I.B.A.,

and will meet weekly till October. Another lecture is to be delivered in the studio, on Tuesday, 29th inst., at 7.30, on "Scotch Medieval Architecture, having special reference to Glasgow Cathedral," by the lecturer.

## ARCHEOLOGICAL SOCIETIES.

**BRITISH ARCHEOLOGICAL ASSOCIATION.**—On the 16th inst. a meeting of the British Archaeological Association was held, Mr. Allan Wyon, F.S.A., in the chair. The progress of the arrangement for holding the year's congress at Manchester was detailed. Mr. Wells exhibited an ancient horse-shoe of very peculiar form, having been made to encase the foot, to which it must have been secured by bands. It was found with objects of Roman date in Great Swan-alley, City. Mr. Woods reported the execution of some excavations for water-pipes which had been carried through the old Roman gate on the Balcon Hill, Colchester, under his oversight, when the mode of forming the foundations was laid open to observation. No injury of any kind, but very much the reverse, has been done to the ancient work. Mr. Barrett exhibited drawings of a curious window formed of moulded brick which still exists at the Victualling Yard, Deptford. It is dated 1513, and bears the initials of Henry VIII. He also described some of the old customs of the dressing of ancient wells, notably that at Tissington. A paper on the ancient Vitified Forts of Scotland, prepared by Miss Russell, of Galashiels, was then read in her absence by Mr. Loftus Brook, F.S.A. The various specimens in the country were described in detail, and the theories of their formation passed in review. In the discussion which ensued, Dr. Phené, F.S.A., referred to the existence of vitified forts in Hungary and in many other countries, and produced a fragment of basalt melted, and joined to sandstone, from a fort in Brittany, where internal buildings as well as external walls had been formed by the action of fire. Dr. Winstone and other speakers referred to the properties of culm and other seaweeds, to form a flux, and suggested that it was used in the construction under review. The few specimens of vitified forts in England were mentioned.

## Illustrations.

## THE PROPOSED NEW CATHEDRAL, BERLIN.

**N**EXT month the German Emperor proposes laying the foundation of the new cathedral of his capital. The Prussian Diet has already agreed to the estimated expense, and an army of workmen is busy on the site. The Emperor has also already determined when the building is to be consecrated, so that it seems probable that at last Berlin is really to have the cathedral for which she has been striving nearly two centuries.

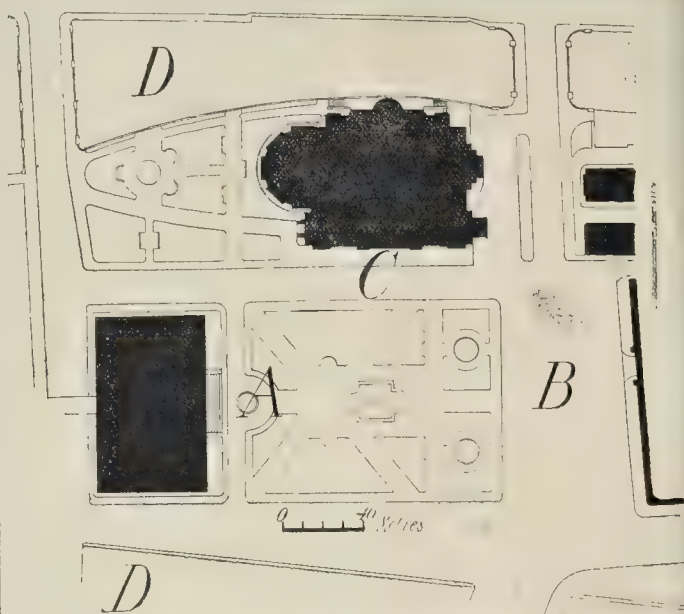
For the history of this cathedral practically commenced two hundred years before its consecration. Frederick I., King of Prussia, as far back as 1703, ordered his Court architect, Schlueter, to prepare the first design for the building. The King's ambitious ideas not being feasible at the time, the matter was dropped; but the initiative given, after much controversy, practically resulted in the erection of the old Berlin "Dom," which has now had to be pulled down to make room for the new one. The old "Dom" was built under the superintendence of the Court architect, Boumann, between 1747 and 1752—i.e., in the reign of Frederick the Great. It was restored and enlarged in 1816, Schinkel acting as the architect on this occasion, and Frederick William III. as client. During the two decades previous to this restoration there had been a number of proposals as to an entirely new building, but it was not until the repair of the old "Dom" had been ordered that Schinkel was also officially commissioned by the King to prepare a design for a grand cathedral, which was to have a more suitable site than the existing one. The tranquil state of Prussia at the time encouraged the realisation of the scheme, but it was practically left to Frederick William IV. on his accession to the throne (1840) to take the somewhat rash step as having the foundations of a new cathedral commenced without first assuring himself of the necessary financial support. The works had soon to be stopped, and the enormous masses of bricks and mortar, after having been an eyesore for half a century, have at last had to be removed, in the same way as the old "Dom," to make room for the building now started at the present Emperor's command.



Soon after the Berlin riots of 1848, the Cathedral scheme again came to the foreground, but without any practical result. It was left to the old Emperor William I., then only King of Prussia, to take what was at that time the novel step of opening an architectural competition for the design in 1867, and to his son the Crown Prince, afterwards Frederick III., to have some of the proposals made on this occasion further developed. The competition created considerable sensation at the time, though it had no direct result. Fifty-one designs were sent in, and ten premiums were awarded. The estimates of the buildings proposed varied between nine and twelve million marks (or 450,000*l.* and 600,000*l.*), sums which meant more at that time for Prussia than they do now, and most of the designs showed a central disposition, with a cupola at the crossing. The drawings sent in at this competition have served as the basis on which Herr Raschdorff's design has been developed.

It was the Emperor Frederick, then Crown Prince of the German Empire, who gave Professor Raschdorff the commission to prepare a design for the cathedral, in accordance with a "programme" which he had personally prepared, and the learned Professor most carefully worked to his Royal client's requirements, and practically under his supervision. The site originally intended in 1703, and on which the old "Dom" was standing, had to be used, unsuitable as it was both in its aspect, situation, and shape. The building was to have the aspect of a Renaissance cathedral. As to expense, this question was hardly to be taken into account. One preliminary design followed another, until at the time of the Emperor William's death the Cathedral plans were practically already prepared for his sanction. During the Emperor Frederick's short reign there was no time for the initiation of such a scheme, otherwise the cathedral would no doubt have been the first monument he would have wished to start. It was left to the present Emperor to see his deceased father's wishes carried into effect, and this he has most loyally done; site, architect, and to a great extent the design being retained, notwithstanding the enormous opposition he has encountered.

The Emperor Frederick had originally intended that the cathedral should be in direct communication with the royal castle by way of a covered passage, at the gallery level. He had also wished to make the main entrance of the cathedral in some sort a monument to William I. The relinquishing of these two ideas formed practically the only important alterations in the programme. Professor Raschdorff's instructions were to erect a cathedral with its main front to the south-west. The cathedral was in the first instance to comprise what we will term a "cathedral church," a "memorial church," and a "baptistry." The "cathedral church" was to serve the purpose of a place of worship both for the members of the "Dom" parish and the Imperial Court. It was also to be available for great Court or State ceremonies such as we have seen here at Westminster Abbey on the occasion of the Jubilee, royal marriages, and funeral services. The cathedral church was to be as imposing as the site would allow, and yet at any cost entirely separate accommodation was to be provided in it for the Court, the Diplomatic Corps, the ministers and clergy, a requirement which certainly interfered with the realisation of the architects' ambition to make full use of his very limited space. The memorial church was to be essentially a kind of mausoleum for the Royal line of "Hohenzollern," its crypt being intended as the last resting-place of the members of that family. There were to be facilities for holding funeral or memorial services in this part of the block, and there was to be easy access to the crypt. The baptistry was to be chiefly for the use of the Dom Parish, and the scene of most of its marriages, &c. It was essential that it should have its own approach, be easily cut off entirely from the rest of the building, unostentatious in character and provided with its own offices. Some class-rooms and the offices of the Dom Chapter had to be found room for, and great care was to be taken to also give these separate entrances. Professor Raschdorff again prepared a number of preliminary designs to suit the present Emperor, and in January, 1891, put the results of his labour before the Prussian Diet and the public. He had had a large and very effective model made by Professor Lesing as well as a full set of tinted drawings to a quarter scale. They were to be seen for many months in the Central Hall of the Arts and Crafts Museum, and throughout the time of their exhibition there was a continual outcry against them. Both the



Berlin Cathedral: Block Plan of Site and Surroundings.

A. The Royal Mausoleum. B. The Royal Castle. C. The New Cathedral. D. The River Spree.

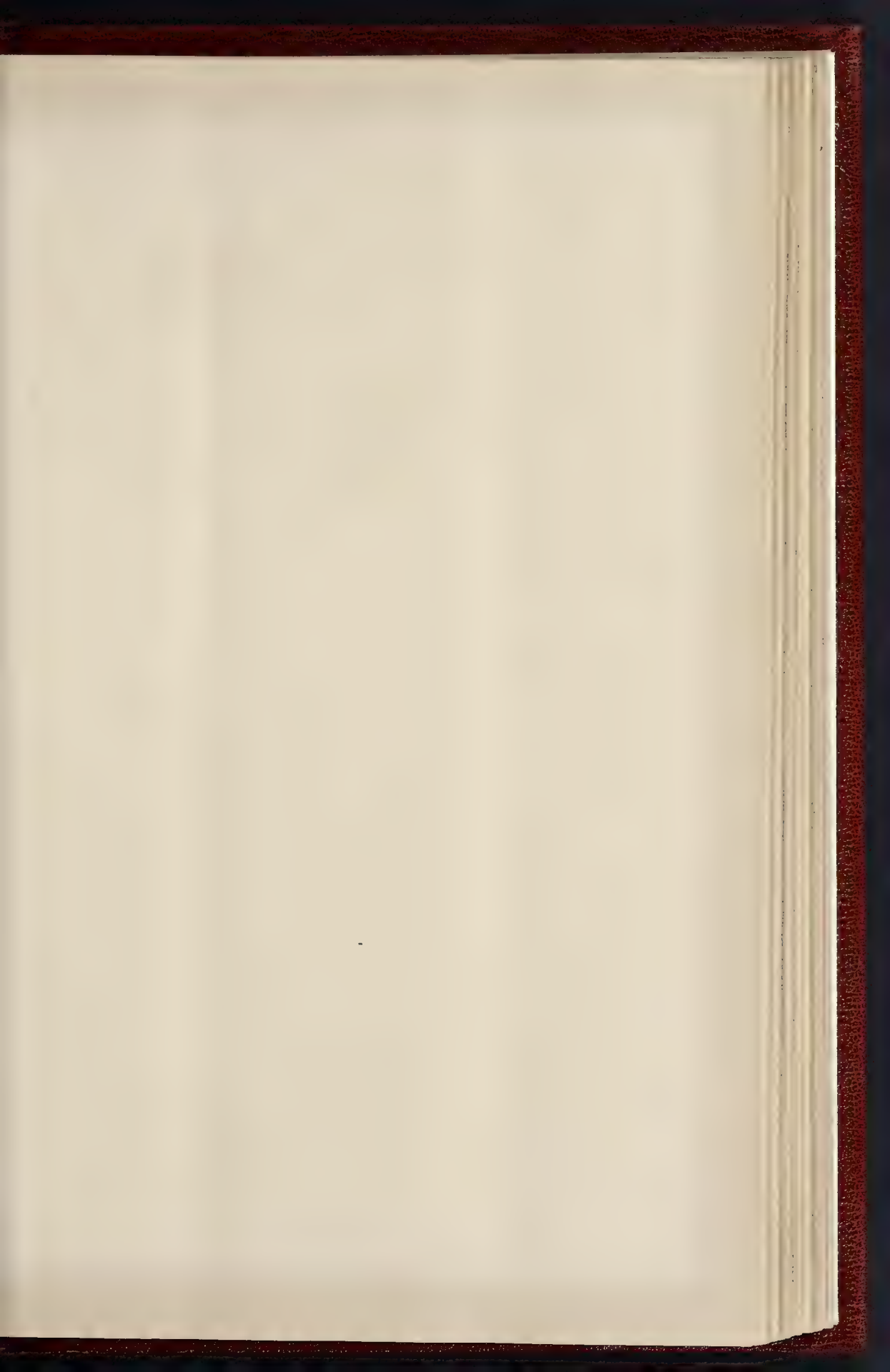
daily and the technical press busied themselves with the subject, and published all manner of counter-proposals. The architectural and Church societies were constantly discussing the matter, and in Parliament the *pros* and *cons* of the scheme took up much valuable time in animated party debates. The cost of Herr Raschdorff's design, which had been estimated at 900,000*l.*, was, of course, also to a certain extent, the cause of much adverse criticism among the ratepayers in the provinces, who did not seem to care to pay for this royal luxury, as it was considered to be.

It would be of little interest to further follow the complications of the case. It will suffice to say that whilst eloquent orators in Parliament told the country's representatives that it was not the idea of having a cathedral that the electors disliked, but the actual design and the architect, the Emperor, on the other hand, simply acted up to his motto, *sic volo, sic jubeo*, and ordered Professor Raschdorff to proceed with his work. The Emperor, however, expressed a wish that he should try to keep down the cost of the building, if possible, to the sum of ten million marks, or 500,000*l.*, and gave him permission to reduce the size of the block and save in the quality of the materials to the extent of this reduction. Herr Raschdorff practically changed the scales at the foot of his drawings so that the dimensions throughout should be smaller by one-tenth, then carefully modified his design with the object of saving in the quantity of the materials used, and revised his specification, ordering inferior materials and cutting out much of the sculptural and fresco decoration he had intended. The result of these alterations was that the estimate for the building was actually brought down to 9,818,900 marks, or 490,945*l.*, a sum which, however, we feel sure will have to be considerably exceeded before the full completion of the work, as it is notorious how regularly the German public buildings exceed their estimates, if the latter have to be cut down to obtain the requisite preliminary Parliamentary or other official sanction. The extra cost generally consists of items for a better class of decoration, which it would mostly be ridiculous to refuse, when the main and most expensive part of the structure is completed. The German architect's pet tactics are to point out the irrationality of using what he calls paint he has specified, and as the stucco and paint he has specified, and he tries to obtain stone, marble, and natural woods instead; he then also points out the inconvenience of postponing the sculptural and fresco decoration until the building is inhabited, and, as a rule, his arguments gain him the day.

The design which we illustrate is the revised one, which is officially at present to cost 490,945*l.* The plan and the details are taken from the actual working drawings, copies of which were kindly lent us by the architect to prepare tracings for reproduction from. There are some discrepancies between the plan and the details on the one side, and the elevation and section on the other, due to the alteration of some parts of the design when it was being redrawn for actual execution. These alterations principally affect the shape of the chapels to the north-west front and the apse to the north-east.

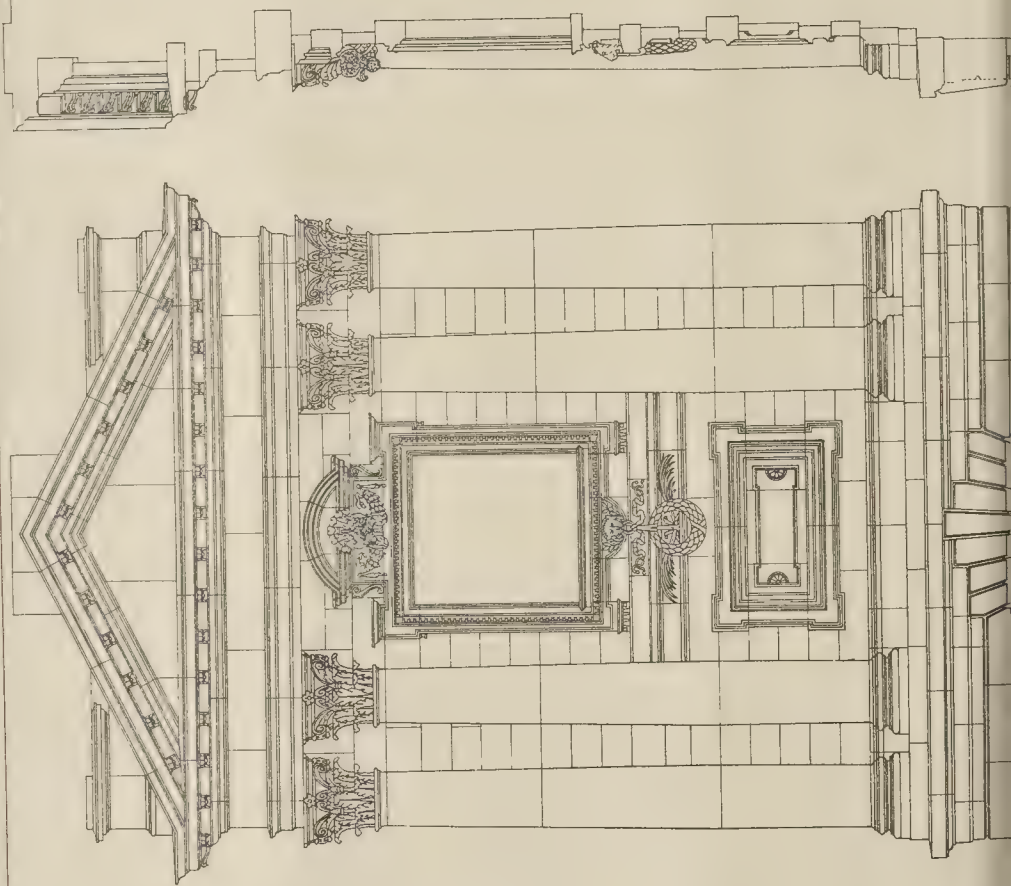
On referring to the block plan the relative positions of the new cathedral and the Royal Palace explain themselves. When approaching from the main thoroughfare of the city, *i.e.*, "Unter den Linden," the aspect should certainly be a very imposing one, the more so if one considers that by the time the cathedral is finished there will be some other museum as a background to the east (the so-called "Museum Island" scheme), whilst close at hand on the west will be the new national monument to the Emperor William I. The main front of the cathedral measures 270 ft. in length. The cross is about 330 ft. above the pavement.

On passing up the flight of steps to the main entrance of the cathedral there will be a fine aspect to the right and left of the great porch, as there is little doubt that the broad passage which runs along the front of the block and is so well lighted will be very effective, the more so if full advantage be taken of a good colour study on this, the sunny side. Three doors from the main entrance proper, a few steps takes one across a somewhat low vestibule to the space under the dome. The height of the porch is 68 ft., the vestibule is 20 ft. high, and the dome (taken at the foot of the lantern) 240 ft. The effect of these sudden contrasts will be somewhat startling, though we fully recognise the difficulties which have beset the architect in fulfilling the requirements put to him. One of these was an order that the Royal seats should be directly opposite the altar. These seats have been placed over the aforesaid vestibule. They could not well have been placed at a higher level. It is under the dome that the services will be held—*i.e.*, it is this part of the building which is to serve as the "cathedral church" proper. The orientation of the altar is exactly north-east, and the pulpit stands exactly to the east. There will be seats for a congregation of one thousand four hundred and eighty on the floor, and besides this there will be a gallery to the south-east—if we





THE BUILDER. MAY 26, 1894



THE  
NEW CATHEDRAL FOR  
BERLIN.

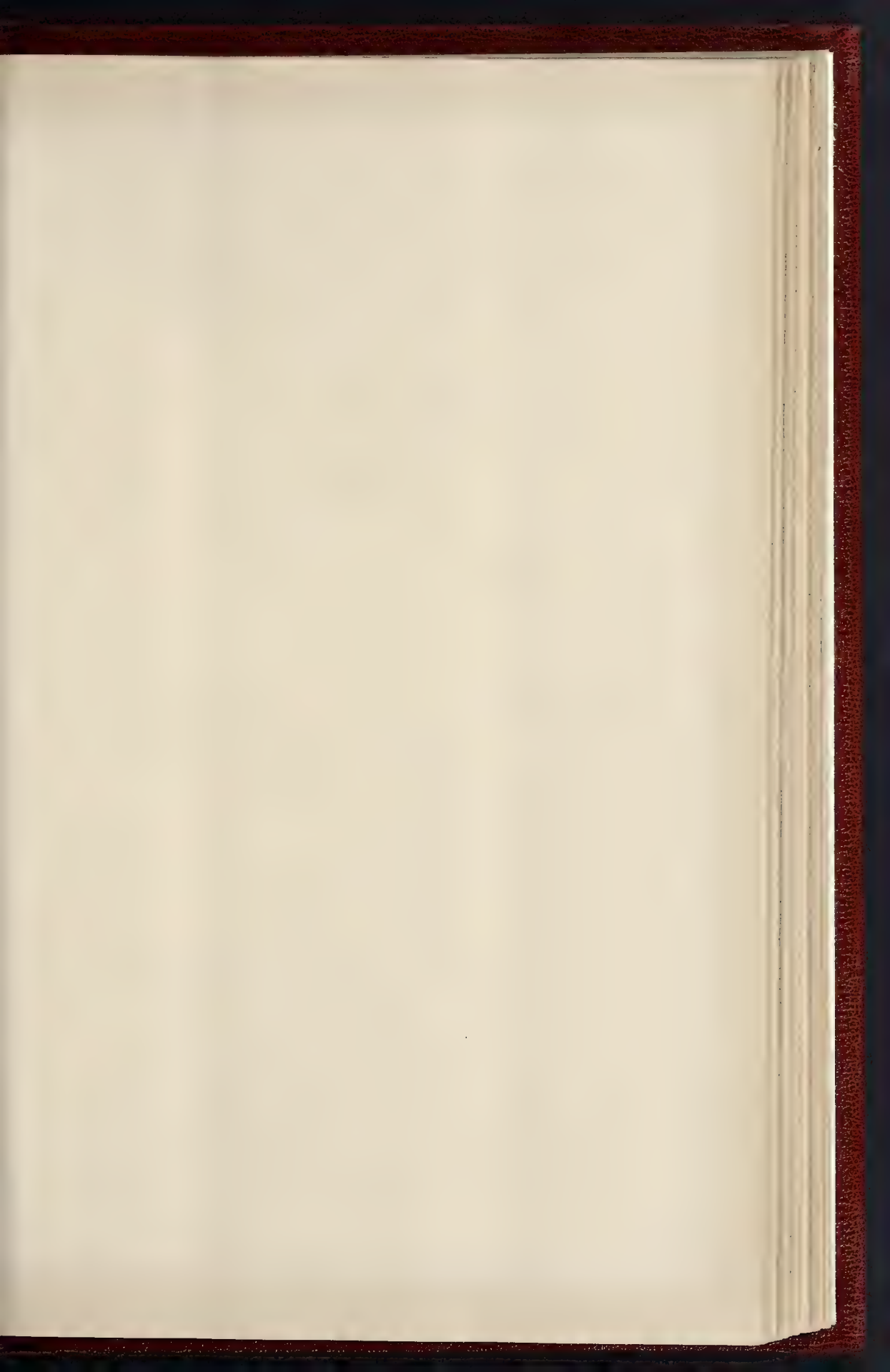
PROFESSOR RASCHDORFF, ARCHT.

DETAIL ELEVATION OF PORTION OF  
ENTRANCE FRONT

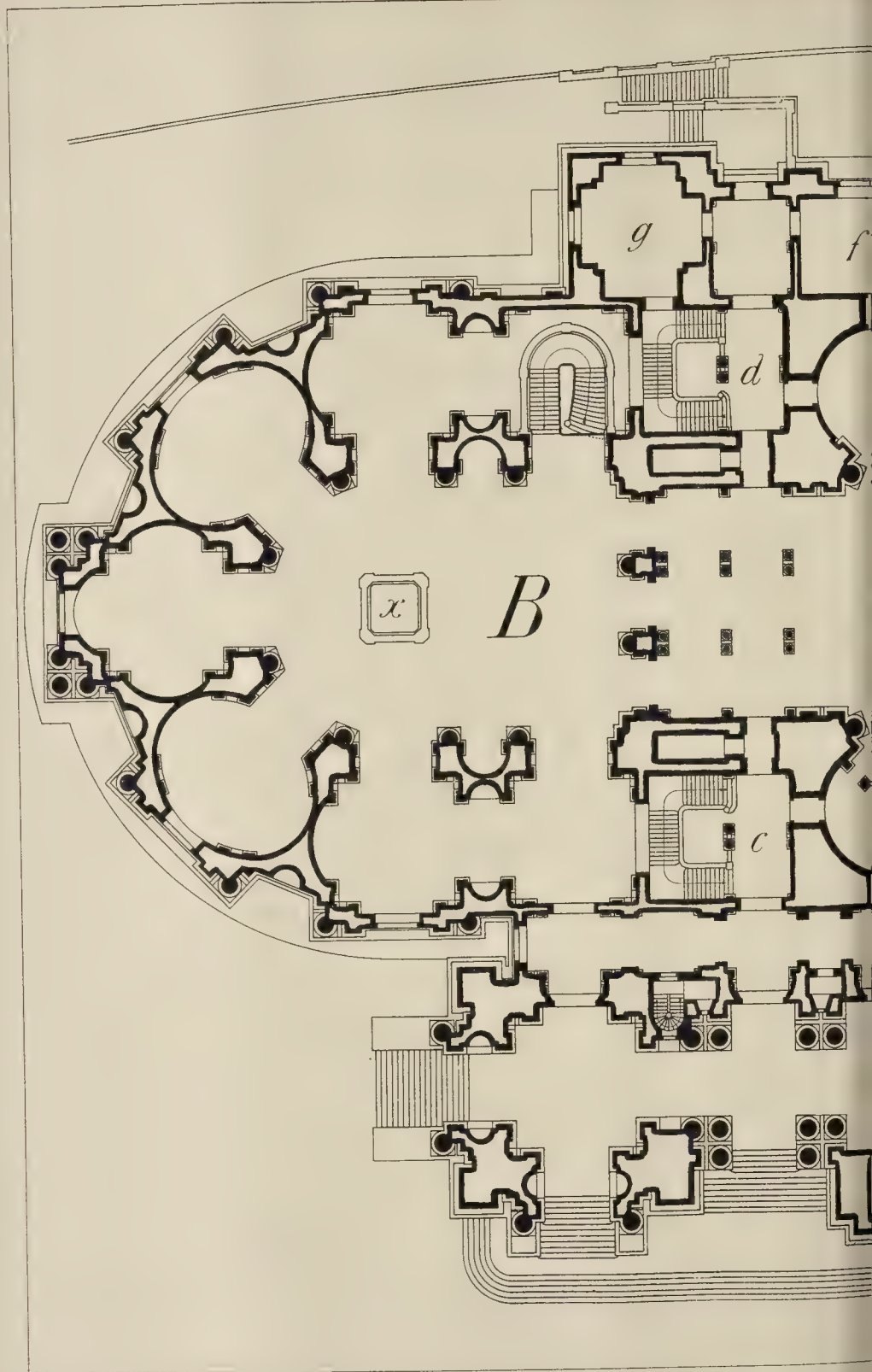


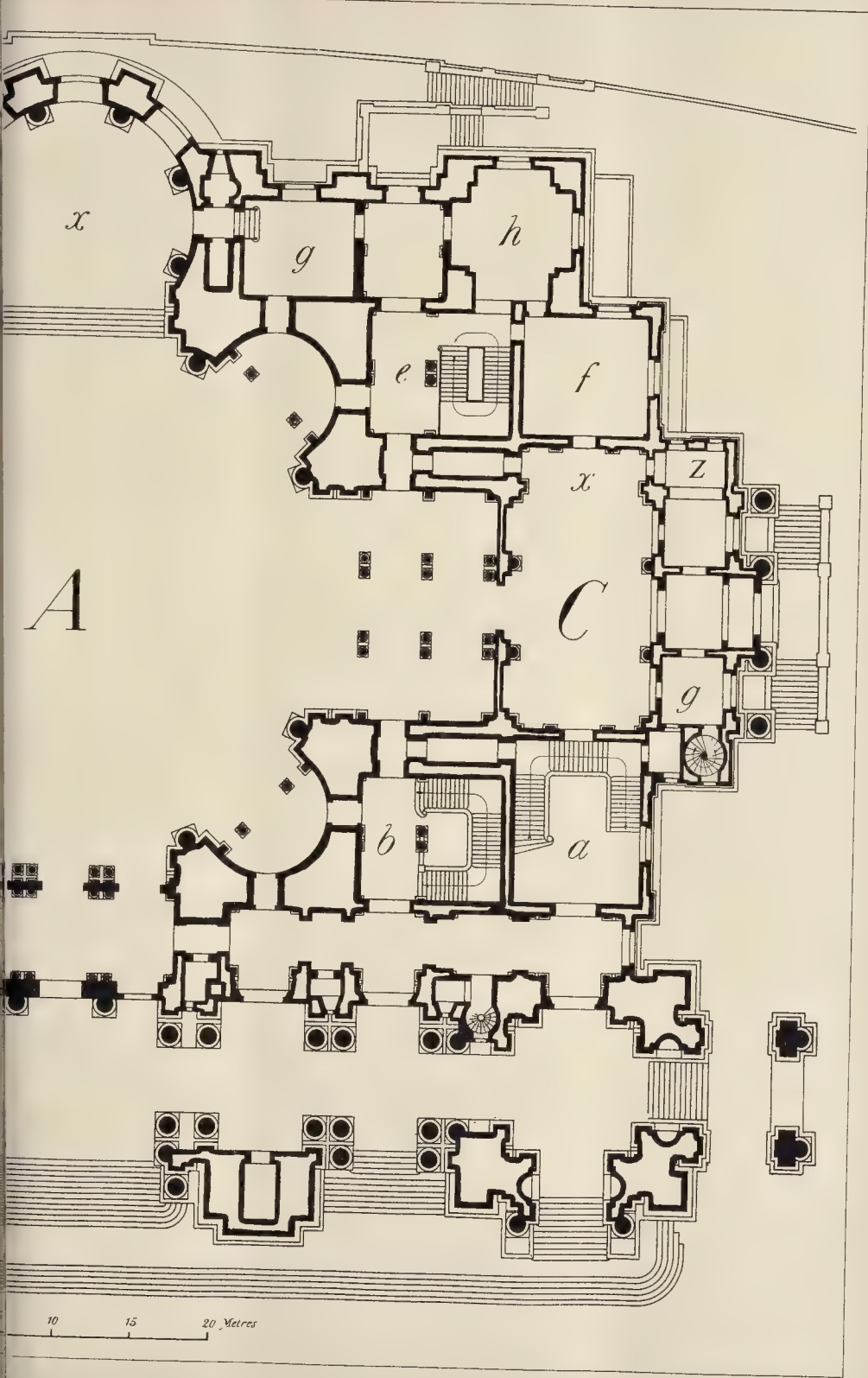
















all it so—for another hundred and twenty, the choir gallery to the north-west for hundred; the court seats, to which we add above, for seventy, and the galleries in three niches reserved respectively for the piers, the diplomatic corps, and the clergy, forty seats each. The total seating accommodation is hence one thousand nine hundred ninety, which, on extraordinary occasions, easily be increased to three thousand, whilst the functions, when the majority would be room could be found for quite five thousand at crushing.

The chief dimensions of the cathedral church 10 ft. from the main entrance doors to the top of the altar and 100 ft. for the interior of the dome. As will be seen from the plan, the light enters at eight sides through the windows between the two entablatures and the piers at the base of the dome. Some will also enter through the lantern. The offices in connexion with the cathedral proper consist of a vestry and a waiting-room on either side of the altar, each of which has their own entrance and lobby from the east front.

regards means of ingress and exit the plan there will be a sufficient number. There also be ample communication with the piers, five staircases having been provided for purpose. One of them is reserved for the Members of the Court intending to use the seats.

al seats have a special carriage approach south-east end of the long passage on the east front. There is a separate lobby for their d a lift has been provided. The other staircase is reserved for the Diplomatic Corps.

The approach to this staircase can be cut off when requisite, and the whole of this Diplomatic corner kept private if the plan requires it. The Ministers of State will use the west staircase, whilst the clergy will share the staircase with that part of the congregation (probably Court officials) which is to have the south-east gallery. The choir has a staircase at the north corner. The two main staircases, which are approached from the north-east front, also lead to the common and class-rooms, which are on the same level as the galleries, and to the offices of the chaplains and treasurers to the "chapter."

the north-west of the dome the design shows a proposed memorial church, which, with its piers to form a kind of *campo santo*, in which al and other services can be held on occasions. Though this part of the plan has its own approach from the outside, the north-west corner of the main front, the principal entrance will practically be from the cathedral church through three doors on the north. The plan here explains itself, the ring of the chapel, if we may call them so, excellent opportunities for placing the piers, whilst the top-lighted centre part is free for the services. As will be seen, the use is to give easy access to the crypt, which will be a very extensive one, including, as it is, the space under the dome. The crypt will be well ventilated, and the part under the dome will be fairly lighted from an opening round the north-east side of the block, the light of the crypt averages from floor to top.

apitistery required both for small christenings and marriage ceremonies has been given a place on the south-east front facing the Royal Chapel. It is practically an entirely independent building, with its own approach, piers, lobbies, and sacristies, though it can be reached from the Cathedral Church by three doors and from the Royal Chapel and staircase by a fourth. The altar has its own approach due north-east, and there will be seating accommodation for a congregation of 160. The main dimensions of the crypt are 30 ft. by 65 ft. The lighting will be on the top and partly from the side. A staircase leads to a small gallery opposite

entering the innumerable complicated details which have had to be fulfilled by the architect on a site so little suited for a church of the kind, one may say that Professor Keith may be congratulated on the cleverness of his church. He has very cleverly turned a bad case as far as his planning is concerned. The number of difficulties he has surmounted are only to be equalled by the number of criticisms he has had to contend with. A Court favourite and unpopular in

the actual architectural treatment, both of

the façades and the interior, one may say that though most academically correct from the German point of view, they will probably find but few admirers in this country. The younger generation of architects abroad call the building "an encyclopedia of Italian Renaissance architecture," and only wish its different parts to be labelled. This is somewhat hard on Herr Raschdorff; though there is little doubt that parts of the design have been most carefully compiled from standard works. It is just this compiled work which is, however, the essence of what is termed the "Berlin School."

As to the materials, we understand that the cathedral will be of brick faced throughout with natural freestone. The extent of the sculptural and fresco decoration depends on the actual cost of covering in the building.

The demolition of the old "Dom" was commenced in February, 1893, and occupied the contractors four months. The old building was used for blasting experiments by the Royal Engineers. The foundations which King William IV. had so rashly commenced were then demolished and the actual excavations for the new building commenced. Some two-hundred men were employed, the contractor being Herr Moebius, of Berlin. Working hours were prolonged last winter till 9 and 10 p.m., electric light being laid on.

Professor Raschdorff, who is one of the instructors at the Royal Technical College, is a native of Plesz, where he was born in 1823. In 1853 he was made City Architect at Cologne, where he remained till 1879. He was the architect of the English Church at Berlin, the erection of which was practically arranged by our Princess Royal, and it was essentially due to the successful completion of this work, for which no fees were charged, that Crown Prince Frederick made him his adviser in the cathedral scheme, and finally his architect. Herr Otto Raschdorff, his son, acts as the architect's chief assistant.

The lithographs in this issue are the first illustrations of the design that have been published.

The following are the references to the letters on the lithographed plan of the cathedral:

- A. Cathedral Church.
- B. Memorial Church.
- C. Baptistry.
- a. Staircase for the Court.
- b. Staircase for the Diplomatic Corps.
- c. Staircase for the Ministers.
- d. Staircase for the Choir.
- e. Staircase for the Clergy and Court Officials.
- f. Vestry.
- g. Waiting-room.
- h. Beadle.
- x. Altar.
- y. Pulpit.
- z. Font.

## Correspondence.

To the Editor of THE BUILDER.

### THE HEATING AND VENTILATION OF THE HOUSES OF PARLIAMENT.

SIR,—The discussion of this subject need not be personal; your readers can judge if my previous letter contained either "misrepresentation" or "ungenerous language" attributed thereto by Mr. Keith.

Surely one has a right to challenge the wisdom of public money being expended upon a national building, when a proposal is made to carry out a scheme of ventilation based on a dual system of "propulsion" and "extraction."

The mere repetition of a general statement written by a man of acknowledged ability, of the dictum of an eminent, but anonymous, architect, and of opinions of undefined experts, upon which Mr. Keith appears to rely, does not constitute argument likely to convince those who hold that there must be loss of power, unnecessary complication of appliances, if not absolute failure, when the plenum and exhaust systems of ventilation are together employed.

The subject of ventilating and heating has, so far, been almost monopolised by specialists, and I believe it is due to them, far more than to the architects of the buildings, if in those named by Mr. Keith, the means employed are defective.

In so saying I do not imply that the services of specialists should be undervalued, but am of opinion that architects should not be content to leave the heating and ventilation of their buildings entirely in such hands, and then accept blame when failures happen. Rather would I urge that architects should, by observation and experiment, form definite views upon the subject, and work with specialists in perfecting any system which both are agreed will secure the desired results.

Although Mr. Keith makes light of the ele-

mentary fact that air forced into an apartment must displace an equal volume, I maintain that it, and its converse, viz., that when extracting air from an apartment an equal volume must enter, are the foundation upon which any system of ventilation must be built, and my observations convince me that want of success is most frequently due to a confusion of ideas regarding these elementary facts.

If Mr. Keith is willing to discuss the subject from a practical standpoint, let him reply to the questions in the second paragraph of my former letter, and I shall be pleased, with your permission, to continue the discussion.

WILLIAM HENMAN, A.R.I.B.A.

SIR,—Had Mr. Keith confined his remarks to the above question, I should not have written you on the subject, but when he insinuates that the bad ventilation of the National Liberal Club is due to the Plenum system, as a system, I think it is right that such a statement should be contradicted, as it is not the case.

It was my business, two or three years ago, to thoroughly investigate the warming and ventilating arrangements of the Club, at the request of the Committee. Certainly the existing arrangements cannot be said to be satisfactory, nor can the system be said to have been carried out or worked in such a way as to give the best results; still, I was satisfied that such alterations could be made in the present system as would ensure a thoroughly successful application of the Plenum system.

If the alterations had been, or are, carried out which were proposed, I am convinced that the National Liberal Club will be one of the best warmed and ventilated buildings in the country, and this on the Plenum system, and using low pressure steam as the heating medium.

As to the question of the best system to be adopted, should any alteration be made in the warming and ventilating arrangements at the Houses of Parliament, doubtless a combined system of propulsion and extraction, both by power, will have to be adopted; but how applied it is impossible to give an opinion worth anything without thorough investigation and study of the buildings.

One matter in Mr. Keith's letter I can take exception to—viz., the suggestion to use hot water in place of steam. This would certainly be a step in the wrong direction, as the experience of to-day all points to many advantages in using low-pressure steam for such large buildings.

DAVID M. NESBIT.

### STEAM-ROLLING.

SIR,—As the County Surveyor correspondent referred to by Mr. Allan Greenwell in your last issue, allow me to say his figures show that steam-rolling cannot be done for one-eighth the cost of the material.

Mr. Greenwell's figures show that the usual estimated price of tenpence to a shilling per cubic yard of material consolidated, is about the cost for that class of road. With a wider experience (last year I worked thirteen steam-rollers on rural roads) I find the cost varies with the material and weather, cold blast slag being the most costly to consolidate.

I am sorry to differ with my friend, Mr. de Courcy Meade, but my experience is that the heavier the roller the better the work.

ROBERT PHILLIPS,  
County Surveyor for Gloucestershire.

### "SEWER AND DRAIN VENTILATION."

SIR,—In the report of Mr. W. W. West's paper on this subject, as given on page 371 of the *Builder*, he makes statements which are quite unwarranted and highly misleading.

E.g., he says of the system of ventilating drains by means of a fresh air inlet on the house side of a disconnecting trap and an outlet above the roof that "it was in practice either imperfect or useless." Now this is not true in regard to much of the work so done that I am acquainted with. The work can be done, and is often done, in an imperfect manner, but that is not a good or fair reason for condemning the system. As well denounce the use of watches because many keep bad time.

Mr. West further asserts that "They could not ensure that the air inlet would not sometimes act as an outlet and be a nuisance." Now while this may show the incapacity of the "they," Mr. West alludes to, I beg to be allowed to state that in my work I find no such difficulty.

Mr. West's paper, in my opinion, is either a most unjust one or else the result of grave want of knowledge. The suggestion to use the soil-pipes of our houses to ventilate our sewers is nothing new, but is a dangerous plan, and is not justified by any statements Mr. West has made.

W. P. BUCHANAN.



## HOT WATER CIRCULATION.

SIR.—Will hot water circulate in a flow and return-pipe (distinct from the boiler one) connected to a hot-water supply-cylinder, if both the flow and return are led to a lower level than that of the hot-water cylinder?

O. G. B.

Although it is not generally understood that a branch hot-water circulating service can be successfully carried below its starting point—and this, on the face of it, seems opposed to the process of convection, the primary cause of the circulatory movement—yet it can be done if reasonable skill be exercised. No rule can be laid down as to how this can be regularly carried out as the circumstances and conditions in each case must differ, but answering the question as it is put, certainly hot water will circulate, and sufficiently for practical purposes, in a branch circulating service carried down a reasonable distance below its starting-point.

## BOAT-HOUSE COMPETITION, LIVERPOOL ARCHITECTURAL SOCIETY.

SIR.—From what I know of the circumstances of the Students' Competition, the design of which was illustrated in the *Builder* last week, I think your remarks are a trifle hard on the successful competitor. The competition was limited to student members, and by some means Mr. Morgan, who is a professional Associate of the Liverpool Architectural Society, competed, and it was not until after the designs had been adjudicated upon that this fact was found out. The adjudicators then met again and the prize was awarded to Mr. Black, who is a *bona-fide* student. It was unfortunate the drawings had to be exhibited at University College before the mistake was remedied.

JOHN W. BLAKEY, A.R.I.B.A.,  
Member of the Students' Committee of the  
Liverpool Architectural Society.

## MUNICIPAL BUILDINGS, ROTHERHAM.

SIR.—Referring to your criticism of my design (5,333) in the Academy, permit me to inform you that the greater part of the side elevation, so far as regards the windows which you refer to as "deficient in character and originality," is a portion of existing buildings which remain unaltered.

I quite agree with you that that part is as you describe it.

RICHARD J. LOVELL.

## The Student's Column.

## THE STRUCTURE AND PHYSICAL PROPERTIES OF BUILDING STONES.—XXI.

THE COTESWOLD DISTRICT (Continued).

**R**ASSING through the pretty village of Avening, and continuing on the road to Tetbury, we find the

Section at Picked-Piece Quarry.

	Thickness. ft. in.
Tile-like rubble and walling stone passing into coarser stone at base	12 6
Hard stone, used for gate-posts, steps, &c.	6 0
Soft, cream-coloured stone, used for ridge-tiles	3 0
"Weather" stone, cream-coloured, used for sills, caps, plinths, &c.	2 0
Hard "weather" stone of good quality	2 0

An illustration, taken from a photograph of this quarry was published in our pages some time since,\* from which the student will glean something of the nature of false-bedding and kindred phenomena, as applied to oolites. The structure of the two bottom beds is very similar to that illustrated in fig. 33.

Retracing our steps to Avening, and taking the road to Nailsworth we come to the largest working in the district, known as Ball's Green quarry. It is a mine, following the stone into the hill for a distance of about a quarter of a mile, and was opened about 100 years ago. The section at the headings now worked shows about 20 ft. thickness of stone in four to six beds, depending on the precise location. Whilst the ceiling is horizontal, the beds are slightly inclined, so that on nearing the roof the stones become wedge-shaped, and eventually altogether thin out. The uppermost beds are best in quality, and we noticed that these frequently measured 7 ft. in thickness; vertical joints not being very close together, immense blocks (larger than would be required in practice) are obtainable. The ceiling is about the worst we have ever seen; the joints therein are not apparently connected in any way with those in the building stone beneath, but when a portion is about to fall the quarrymen are apprised of the fact by the continual dripping of water and clay.

It is thus a difficult quarry to work, and would probably have been abandoned years ago if the building stone were not of such excellent quality.

\* See the *Builder*, October 26, 1893.

The method of quarrying is rather peculiar; but is to some extent warranted by the exceptional system of jointing, and also by the nature of the material. The stone is not sawn *in situ*, but blasted; this cannot improve its quality, as shakes and vents are likely to result from such a drastic procedure. At the same time it is so hard that the system of picking a "jad" close to the ceiling and then levering out the blocks could not be economically resorted to. Another effect of the blasting is that the blocks are necessarily irregular in shape. The shot holes are horizontally drilled with stock and bit at the rate of 18 in. in 20 minutes. The method of firing is primitive in the extreme. After the charge is placed in position, a fuse consisting of a wheat straw filled with fine powder is inserted in the hole and the tamping is rammed home. Such methods were commonly in vogue fifty years ago.

The stone from Ball's Green quarry is cream-coloured and is a perfect oolite as will be seen on reference to our illustration (fig. 34). It con-

FIG. 34.

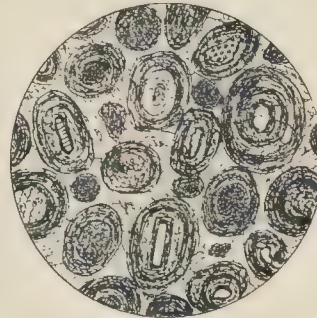


FIG. 34.—Microstructure of Ball's Green "Painswick" stone.

sists of tolerably regular oolitic granules showing structure in beautiful detail, and very crystalline. Here and there the detached spine of an echinoderm (not shown in the illustration) and the ossicles of crinoids make their appearance; the whole are cemented together by calcite so thoroughly crystalline in nature that the two predominant sets of cleavage planes are distinctly visible. When carefully selected, Ball's Green stone must be very durable. In former years it was much sent to Ireland, and is now largely used for church work, being especially suitable for ashlar, caps, bases, &c.

Not far from this is another mine in the Inferior Oolite with stone of somewhat similar character; it was not being very actively exploited at the time of our visit. In the valley on the other side of Minchinhampton Common is an old working known as Wall's quarry, and other mines may be found on the Bath-road, Nailsworth, and at Brimscomb, near Stroud.

In the vicinity of Wotton Underedge (to the south-east of the area shown on our map, fig. 32) the Inferior Oolite is well displayed and forms good building stone. At Huddingknoll Hill quarry, near Gloucester, it presents about 9 ft. of workable stone in three beds, which may be described as shelly limestones with oolitic structure developed in the upper portion. Near Birdlip, between that place and Leckhampton Hill, are some old quarries and one recently opened, supplying stone of fair quality. Judging from the circumstance that at the time of our visit loose granules were freely strewn over the floor of the workings, we should imagine that the matrix hereabouts is not as durable as the granules.

On the Cotteswolds, north of Cheltenham, on a hill called Cleeve Cloud (from the village of Bishops Cleeve) several quarries are situated in the Inferior Oolite. The freestone division is also worked at Bourton-on-the-Hill, Broadway, Guiting, Stanway Hill, Brockhampton, and Longborough. At Stanway Hill a large quarry shows a vertical section of 35 ft. capable of yielding blocks of any required size, the whole of which are of a yellowish-brown tint. At Bourton-on-the-Hill some of the beds are traversed by bands of hematite (sesquioxide, or peroxide of iron). In fact, a large monograph might be written on the innumerable small quarries found on the elevated tract of oolites between Bath and Chipping Campden, in the north of the Cotteswold Hills.

An immense quantity of stone has been raised

from the Inferior Oolite of Dundry Hill, near Bristol, which locality does not fall quite within the districts we have laid down, but may be conveniently referred to here. The principal quarries are on the west side of the hill. The stone is a shelly oolite with a calcareous matrix, rather iron-stained. It has been much used in Bristol where, however, it does not seem to be stood well, judging from experience of behaviour in the church of St. Mary Redcliffe and elsewhere.

## 8. THE OXFORD DISTRICT.

But little need be said concerning this district which is not a celebrated stone-producing one. The white limestones of the Great Oolite are largely quarried about Souldern, Croughton, Aynho. Near Monk's House the formation consists of flaggy, and hard white sandy limestones in beds of 3 ft., 1 ft. 6 in., and 1 ft. 3 in., whilst Mixbury section gives hard, cream-coloured, white limestones up to 3 ft. 6 in. on the bed. The small quarries hereabouts in the Great Oolite yield stone which may be described as shelly limestones with little oolitic structure.

Between Brackley and Buckingham, quarries are very numerous, but are chiefly drawn upon for rough stone. They are at Westbury (sandstone and limestone), north of Shalstone-hill farm, where the beds yield a very hard white limestone of exceptional quality, also at Baffer's Holt, Boscawen, &c. Near Thornborough are large quarries of white sandstone, interstratified with hard, yellow limestones; round Wickham, and at Stone the Great Oolite is extensively worked. The Cornbrash and Forest Marble provide material for estate purposes almost over the whole of the district where these rocks crop out.

The best-known quarries near Oxford are at Headington, showing false-bedded common shell limestone 16 ft., which was formerly very largely in that city, but has not stood the time very satisfactorily. At Brill and Harpenden near Aylesbury, the Portlandian is worked for building stone. The micro-structure of the stone at the former locality is very similar to the bed Portland, but it is much rougher, and of irregular blocks.

## 9. THE KETTERING DISTRICT.

The building stones in this and the following districts have been so fully described in our columns on a former occasion,\* that a need now attempt is to briefly describe the micro-structure, reserving the results of physical tests, as in the case of the stones alluded to in the last article, for a comparative table to appear subsequently. We may just remind the student, however, that the principal building stones, of which there are several in the Kettering, Stamford, and Ancaster, from that geological division known as the Lincolnshire Oolite, which is the stratigraphical equivalent of the Inferior Oolite of the Cotswolds.

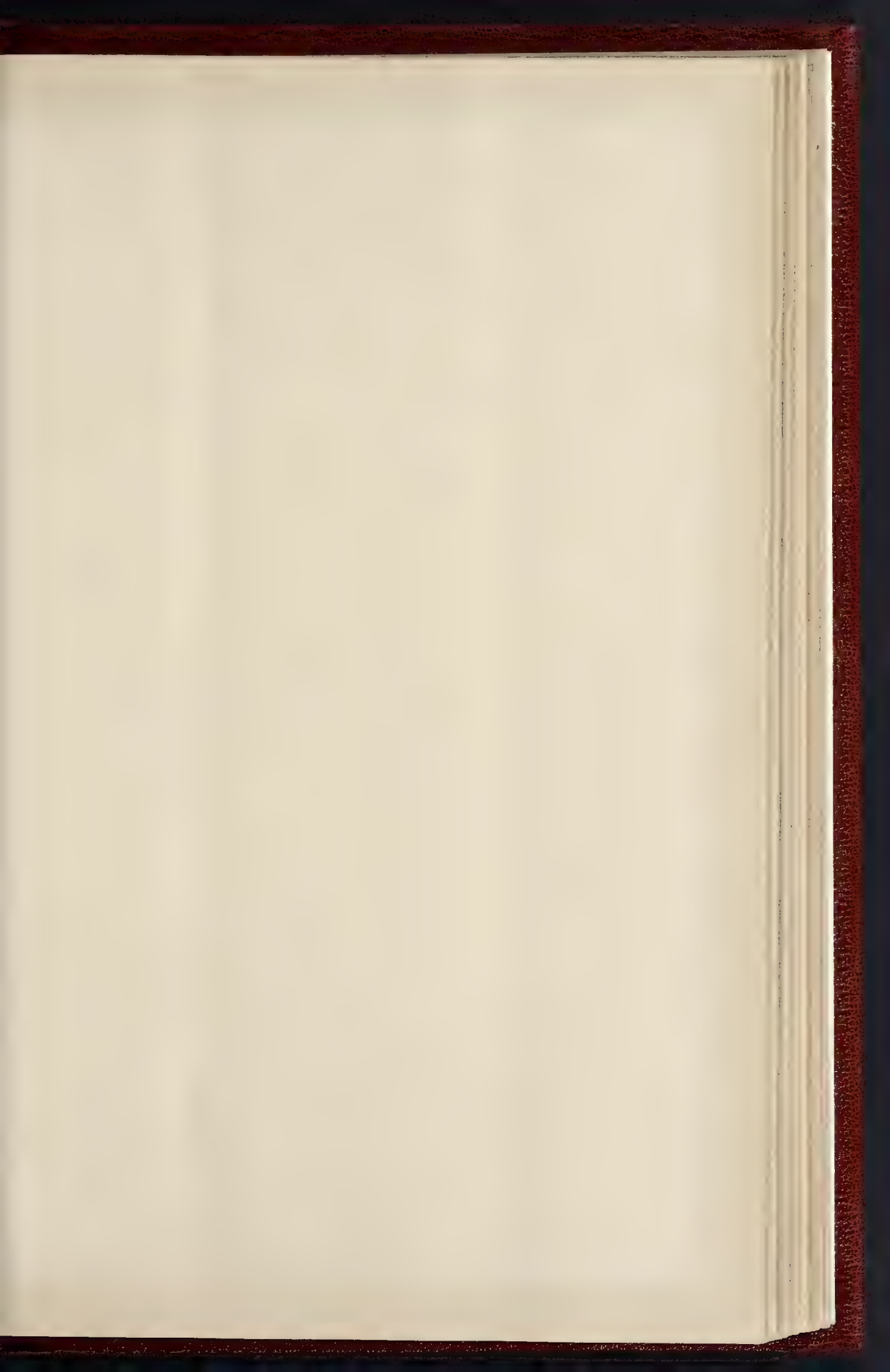
The chief building stones in the Kettering district are those at Weldon, divided for commercial purposes into two beds—the A 1 bed and the A 2 bed. Blocks of practically any size are obtained; it is useless to give the horizontal measurements of each bed, as the horizontal jointing is so variable—the courses are irregularly disposed, which occasions some trouble in working, but this drawback is more than compensated for by the facility with which the stone can be driven into and mined.

Under the microscope the A 1 bed is seen to be composed of well-formed oolitic granules, fragments of organic remains coated with carbonate of lime. It differs in structure, however, from any other freestone with which we are acquainted, in that the granules so frequently interpenetrate each other. Their character recalls the familiar Bath-stone granules, but they are more crystalline; further, they, to each other by their outermost coating, there is no matrix worthy the name. The brittleness of the material is largely dependent on the crystalline nature of the granules, and especially on their tenacity and interpenetration. The micro-structure of the A 2 bed shows more matter, and both that and the granules are more earthy than in the A 1 bed, which is stone is browner in tint. It is disintegrated, the laminae consisting of small sized particles. Matrix is abundant local concretions in both the beds.

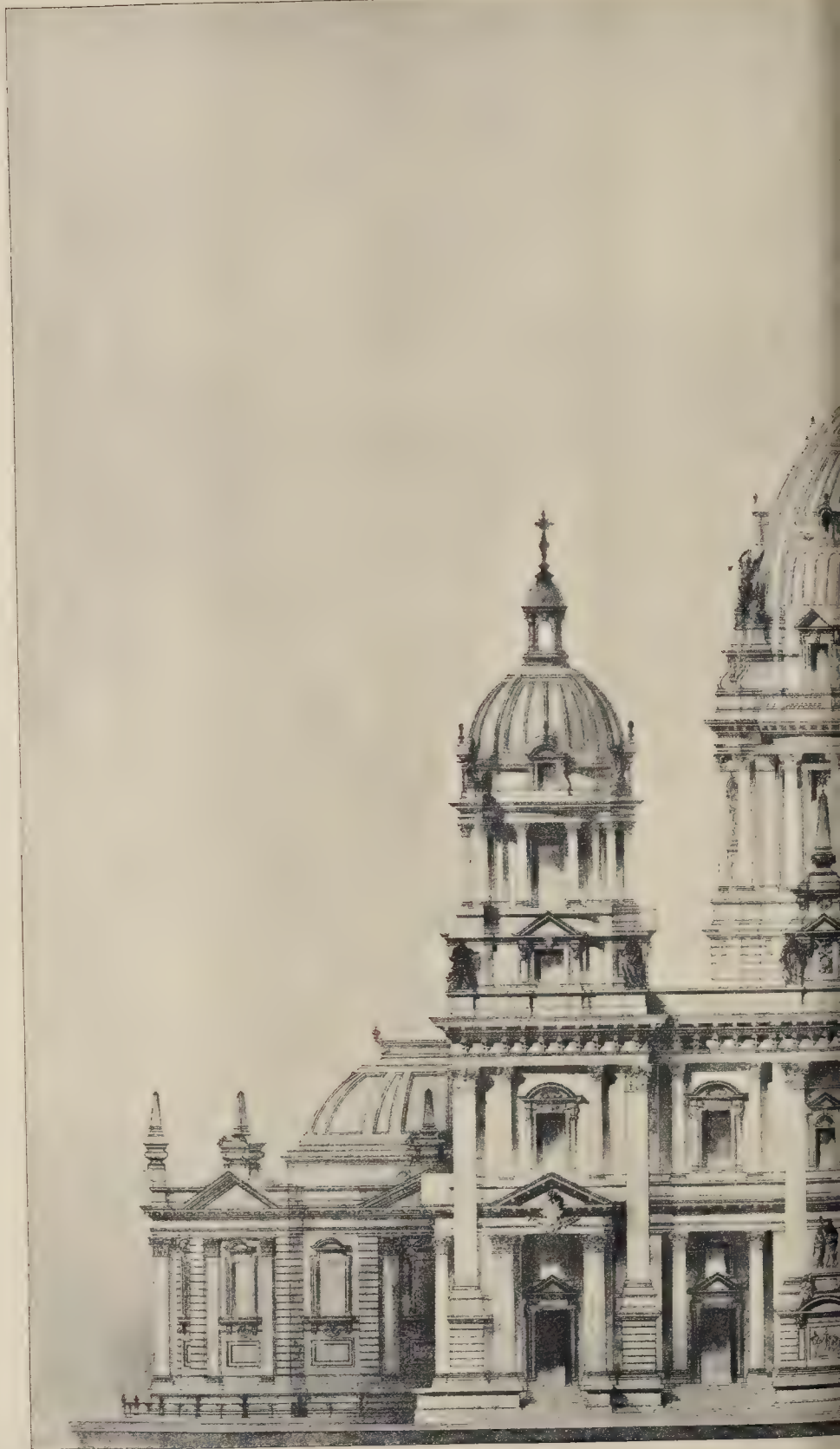
## 10. THE STAMFORD DISTRICT.

The principal quarries are at Ketton, where the beds are of variable thickness, but mostly 2 ft. 6 in. to 3 ft. 6 in. on the bed. The

\* See the *Builder*, January 10, 1891.







THE NEW CATHEDRAL



W. R. 1851. PHOTO SPRAGUE & CO. 48-51 AD. HADSON STREET, EIGHTH FLOOR, N. Y. C.





of Ketton stone is easy to describe, and could recognise it in a moment from its plicity. It possesses the most perfect structure of any Jurassic building-stone in the Kingdom. The granules are mostly spherical, with nucleus and concentric structure very regular; they are regular in size, and but very few are of organic fragments are foreign matter or organic fragments are foreign matter. So far, it agrees with two stones described—viz., from Ball's Green, near (fig. 34), and the "Brown Bed" from Quarry, Chilmark. It differs from the latter, however, by the absence of a matrix, the granules adhering to each other; and from the latter by the absence of quartz grains, and by the crystalline character of the granules.

Barnack quarries are interesting, principally on the historic point of view. It is now about 12 ft. of stone in two beds. Barnack rag is noted for its enduring quality; it is doubtful whether the real material available now.

There are several small quarries in the vicinity of Barnack. At Cliphamp the freestone is of a durable material, not unlike Ketton stone, but less even in grain, with a few altered through its mass. Good cream-coloured stone is also raised at Casterton.

# 11. THE ANCASTER DISTRICT.

Atter, near Sleaford, is a well-known stone-quarrying centre. The quarries are situated on the railway station, and there are several of them. Speaking generally, there are three from whence the stone comes—the "Weather" bed, light brown in colour and very compact, and largely used, is from 3 ft. to 8 ft.; and "Freestone," of a cream colour, tools easily, finest beds near Sleaford, thickness 14 ft. to 23 ft. in several beds. The quarries the beds run very thin.

The microscope the "Weather" bed is of a multitude of shell fragments, and the granules scattered about, the whole put together by a highly crystalline matrix. It is not unlike some of the best of Bath stone, but is more crystalline than the latter, generally, whilst the calcic crystals in the matrix remind us more of the "Doolittle" stone. From its microscopic structure the "Weather" bed is of a very durable stone of its class.

"Freestone" bed at Ancaster is, very much in structure to the "Weather" bed, but is finer grained, does not contain the abundance and variety of organic remains which the "Weather" bed contains. Its oolitic granules are practically uniform, and its matrix is not so crystalline as the latter. The "Weather" bed is more irregularly developed. The earthy matrix of a considerable proportion of the "Weather" bed has led to their removal during the preparation of the micro-slide. It does not appear to be as durable as the "Weather" bed. The "Weather" bed is known as "Haydor" are practically unaltered.

## GENERAL BUILDING NEWS.

HOME, LONDON FEVER HOSPITAL.—The new home for nurses, opened last week at the London Fever Hospital, provides separate rooms for thirty-one nurses, with a room for sick nurses and one for two servants. Common sitting-rooms are provided, one for each of the four staff-nurses; in addition there are separate sitting-rooms for the night superintendent and the matron's quarters. There are also on the ground floor, a box-room, two water-closets, and a house-fitted for use as a boot-cleaning-room. On the two upper floors there are two bathrooms on the ground floor is one bath-room. The corridors and staircases throughout are of concrete and iron, the corridors being covered with cement. All the rooms are furnished with iron beds, and each nurse is provided with a bed, no nails being allowed in the walls. The building is faced with picked stocks, and has a tiled roof. Underneath the brick arches and quoins and cast cement pillars, and the windows. Underneath the pillars are the boiler-rooms, in which are two boilers, one for the baths and draw-off, and another for the coils which heat the staircases. The general building work was carried out by Messrs. Lawrence & Sons, of Wharf road, and the red concrete by Messrs. Lascelles; the ironwork by Messrs. Dent & Hellyer; and the plumbing by Messrs. Slater & Co.; Mr. Ward was the architect. The total cost of the building was £15,113. The architect was Mr. Keith.

PUBLIC HALL, WARRINGTON.—A new public hall is being erected at Warrington, the architect is Mr. William Owen, of Warrington. The hall will stand on the south side

of Palmyra-square, and will be 108 ft. by 64 ft. inside, exclusive of an organ chamber 30 ft. by 16 ft. The body of the hall on the ground floor will be 90 ft. by 48 ft. It is surrounded on its four sides with corridors. Fronting the street will be an entrance-hall 50 ft. by 10 ft., with ladies' cloak-room, ladies' retiring-room, and lavatory accommodation at one end, and at the other end there will be a gentlemen's cloak-room with lavatory accommodation. Access will be gained from the entrance-hall into the inner corridor, which, surrounding the seat space on the ground floor, will give admission by eight doors to almost any portion of the hall without interruption. On the ground floor at the east end there will be separate rooms for gentlemen and ladies. On the gallery floor at the west end there will be a front gallery and a back gallery, whilst at the sides of the hall there will be galleries. Entrance to the gallery is obtained at the west end by a stone staircase. The gallery has three exit doors. From the ground floor there are eight means of exit. In the basement there is a heating-chamber and kitchen. The platform is reached from the private corridor by stairs on either side. The organ-chamber is immediately behind it, and on the gallery level there is a retiring-room for lady chorists. By the removal of partitions between the ladies' cloak-room and the entrance-hall and the gentlemen's cloak-room and entrance-hall, the entrance can be made 85 ft. long, and can be used as a refreshment-room in connection with the hall. The clear height of the hall inside is 45 ft. The hall will accommodate nearly 2,000 people. The contract has been let to Mr. R. W. Collin.

REPAIR OF WEST KNIGHTON CHURCH, DORSETSHIRE.—The ancient church at West Knighton, which was closed for repairs in August last, has just been re-opened. The chancel roof, which was decayed, has been removed and a new roof of stone tiles erected. The inner walls have all had the old plaster cleaned off and been cemented throughout. Mullions and tracery have been added to the windows on the north side, and both windows have been made uniform. This restoration was carried out under the direction of Mr. Thomas Hardy. A little window has been re-opened in the chancel. All the windows have been reglazed except two that contain painted glass. An irregular little window with a wooden frame in the upper part of the south wall has been built up, and a sky-light has been opened to light the gallery. When removing the plaster from the south wall of the nave an old arch with pillar and a portion of a second arch were discovered. These have been restored. Traces of old frescoes were discovered on the wall of the south transept and over the church door, and inscriptions on the south wall of the nave. The gallery has been removed, and a new gallery has been put in its place. The font, which was under the gallery, has been placed near the church door. The floor has been laid throughout with encaustic tiles.

CHURCH, OXFORD.—The Bishop of Oxford recently laid the foundation stone of the new church of the Society of St. John the Evangelist, which is situated on the Iliffe-road. The building will be of early thirteenth century character, and be strictly English. The plan shows a western tower, open to the nave, and almost a continuation of it. It is proposed to screen off this western part of the church with open iron screens. The nave and choir are of unbroken length, the former 88 ft. long, and the latter of a length of 60 ft. The nave, including the side chapel, will accommodate 800 persons. On the north side an aisle forms a "people's chapel." This chapel is 57 ft. long and 17 ft. wide, and will seat ninety-five persons. Externally, the building will be of stone. There will be no chancel arch; but two large stone arches are thrown across the church, and are supported by flying buttresses, surmounted by stone pinnacles. The church is chiefly lighted by clerestory windows of tall proportion. The church has piers and arches, eight in number, on each side. The complete fabric will cost about £2,000, but it is proposed to begin by putting in the foundations underneath, and to build so much as can possibly be undertaken for the sum of £5,000. Messrs. Bodley & Garner, London, are the architects, and Mr. H. R. Franklin is the builder.

ENLARGEMENT OF THE PARISH CHURCH, PRINCE-OF-WALES.—This church has just been enlarged under the plans of Mr. Henry Stone, by Messrs. Wm. Bell & Sons, of Southampton. The enlargement consists of an addition to the nave, westward, which has been effected by carrying out the west wall and campanile rather more than 21 ft., and by extending the south wall so as to meet it. Room for 100 additional sittings has been gained, with due space for the font, and a small vestry.

INSTITUTE, PITCHFORD, PERTSHIRE.—A building, which will be known as the Barbour Institute, is to be erected at Pitchford, in Perthshire. It has a frontage of 55 ft., and is 50 ft. in width. In the basement, quarters are provided for a caretaker. On either side of the hall are refreshment rooms, with service pantry adjoining; ladies' room, caretaker's office, kitchen and scullery, cloak-room, and lavatory accommodation. On the first floor are billiard-room, committee-room, and reading-room. By removing a partition the committee-room and reading-room can be converted

into a gymnasium. A smoking apartment has also been provided. Throughout, the building is heated by steam, and there is a supply of hot and cold water in the bath-rooms. The architect is Mr. J. Murray Robertson, Dundee.

INTERMEDIATE SCHOOL, BRIDGEND, GLAMORGANSHIRE.—The foundation stone of the Bridgend Intermediate School was laid by Lord Dunraven on the 21st inst. The building will provide accommodation for 120 scholars, and will cost about £3,500. It is designed in native stone, with dressings of white Quarrel stone and blue-black brick. The ground floor is divided into a general assembly-room, five class-rooms opening into corridors, a cooking class-room and pantry, a gymnasium with store-room, a laboratory, and a room each for the head-master and head-mistress, and the usual laboratories. There will be a large playground, with shelters. The architects are Messrs. Lambert & Rees, Bridgend, and the contractors Messrs. D. C. Jones & Co., of Gloucester.

ELECTRIC LIGHTING WORKS, WOLVERHAMPTON.—The Mayor of Wolverhampton (Alderman C. T. Mander), on the 21st inst., laid the foundation stone of the Wolverhampton Municipal Electric Lighting Works, in Commercial-road. Mr. A. P. Brevitt is the architect of the works, Mr. H. Willcock being the builder.

WESLEYAN CHAPEL, PLEASLEY.—A Wesleyan Chapel and school buildings are to be erected at Pleasley, in Derbyshire. The new buildings will consist of chapel, schoolroom, two class-rooms, vestry, and the necessary offices. The site necessitates the school being under the chapel. The main entrance is from the ground level, and stairs lead down to the school and up to the chapel. The roof will be partially open, the main timbers all showing, and docket underneath with curved ribs. The pews will have sloping backs and solid bench ends, and the rostrum is to be of pitch-pine. The general building material will be brick with stone dressings. The joinery work will be carried out in pitch-pine. The chapel will measure 55 ft. 6 in. by 34 ft. 6 in. inside, and will seat 278 adults. The schools and class-rooms will provide sitting accommodation for 225 scholars. The cost of the work, of which Mr. John Wills, of Derby, is the architect, and Mr. Smedley, South Norwinton, the builder, is estimated at £1,400.

NEW CHURCH AND SCHOOLS, CATTHAYS, CARDIFF.—The St. Monica's new schools and church, Merthyr-street, Cathays, were opened on the 16th inst. The buildings are of Newbridge stone, with freestone facings. The schools are built to accommodate 192 children in the mixed department and 150 in the infants', the cost altogether being about £3,200. Three class-rooms are attached to the mixed department and two to the infants'. The large mixed room will be used also for religious worship on Sundays. A chancel is added at one end. Fitted up with an altar table and other requisites, it is divided from the rest of the room by a metal screen and a curtain. The chancel is fitted with choir stalls. The central window is of coloured glass, and an organ chamber is attached. The builders are Messrs. Lattey & Co., and the architect Mr. Bruce-Vaughan.

CATHOLIC CHURCH, DUDLEY-ROAD, BIRMINGHAM.—The foundation stone of the new church of St. Patrick in Dudley-road, Birmingham, was laid on the 9th inst. by the Reverend Dr. Halsey, Catholic Bishop of Birmingham. The building, which is a twelfth-century French style, is being erected at a cost of £5,000, from the designs of Messrs. Dempster & Heaton, architects and surveyors, of Birmingham, Mr. John Bowen, of Balsall Heath, being the builder.

PUBLIC BATHS, OLDHAM.—On the 12th inst., new public baths, which have been erected in Cedar-street, Waterhead, Oldham, were opened by Alderman J. Hood, J.P. The building is situated on the corner of a plot of land abutting on Cedar-street on the front, and Mortar-street on the side. The superintendent's house is placed at the angle of the two streets, and has lobby, sitting-room, kitchen, and scullery on the ground-floor, three bed-rooms, and also a cellar. In the centre of the block is the ticket-office. On each side of this room are the male and female entrance corridors, fitted with swing doors, having upper panels glazed with lead lights, and separated from the ticket-office by glazed screens, with bay window and registering turnstiles to each, a gate being provided to the turnstiles for use of officials, &c. Behind here there is a cross-corridor, which leads on the left to twelve male slipper-baths, and on the right to six female slipper-baths, there being a separate waiting-room provided for each sex. The whole of the slipper-baths are porcelain, glazed both inside and outside, having no wood-framing round whatever. The supply of hot and cold water to the baths is regulated by means of valves worked by a detachable handle by an attendant in the corridors. From the cross-corridor the plunge-bath is reached, the dimensions of this room being 74 ft. by 45 ft. The bottom of the bath is tiled with black and white tiles formed in panels, the sides being faced with white glazed bricks. A diving platform is provided at the deep end of the bath. Round the gangways are ranged 42 dressing-boxes, there also being the necessary foot-bath, shower, water-closets, urinals, &c. Six Stott Thorp donors



with ornamental wrought-iron scrolls are provided. The entrances to this bath are so arranged that it can be used by either sex without interfering with private bath corridors. At the rear of the premises are the laundry and boiler-house. The machinery used in the laundry is worked by steam-power by means of a vertical steam-engine and shafting driven with belting. A two-flued boiler, made by the Oldham Boiler Works Company, supplies steam for the whole of the system throughout. The floors to the whole of the baths and corridors are of steel joists and finished with granite-faced concrete, being supplied with channels and grids to convey away surplus water. The baths and corridors have dados of white glazed bricks with ornamental bands at top. The whole of the premises are heated by steam. The continuous lantern lights, both over plunge and private baths, are made to open from end to end for ventilation, by means of cranked levers, &c., worked by an attendant from the floor. The whole of the building work has been carried out by Mr. William Lees, the sub-contractors being:—excavating, concreting, and brickwork, Messrs. S. & J. Smethurst; masonry, Mr. J. Bebbington; steel joists, &c., Mr. Edward Wood, Manchester; wrought-iron work, Mr. J. Kershaw; slating, Mr. Joseph Jackson; plumbing, glazing, and painting, Messrs. Harker Bros.; and plastering, Mr. David Rothwell. The steam, hydraulic, and engineering arrangements throughout have been carried out by Mr. W. F. Spencer, Crossbank Works, Oldham, the whole having been executed according to the plans and under the supervision of Mr. Charles T. Taylor, architect, Oldham.

#### SANITARY AND ENGINEERING NEWS.

**PROPOSED SHIP CANAL TO WAKEFIELD.**—On the 9th inst. a conference of public bodies was held at Wakefield to discuss the question of a proposed ship canal from Wakefield to the Humber. Mr. Charles Clay, projector of the scheme, estimated the cost at 6,000,000*l.*, and said that a traffic of 2,000,000 of tonnage a year, at 3*s.* per ton, might be obtained. This would require an average daily traffic of some 34 vessels of 2,000 tons each, which would not be difficult to secure. He also quoted the opinion of Mr. James Abernethy, consulting engineer to the Manchester Ship Canal, as to the feasibility of the scheme. A provisional committee was appointed.

**LOCK AND WEIR, RICHMOND.**—On Saturday last the Duke of York opened the new Thames lock and weir, which is situated near Richmond. The lock itself is situated on the Surrey side of the river, and is of ordinary construction, but is constructed to take six barges and a tug. The weirs occupy nearly the whole breadth of the stream, and are three in number. They are entirely movable, whilst an ordinary weir, such as that at Teddington, may be described as a step built in the river bottom, having shutters or sluices above to control the flow of water. At Richmond, according to the *Times* report, the bottom of the river is unbroken in level, the weir being, in fact, all sluice. Each sluice consists of a large steel shutter, suitably stiffened, 66 ft. wide, 12 ft. deep, and weighing 22 tons. To operate these sluices there is a double bridge above, and this is to be used as a footway connecting Richmond with St. Margaret's on the Middlesex side. The lock is a half-tide-lock—that is to say, it will only be used during the first part of the flood and the last part of the ebb; and it is during these periods that the sluices will be closed. To raise and lower the sluices there is hand-worked machinery on the bridge above, and the balancing by counter-weights is so arranged that one man will be able to carry out the operations at slow speed, or three men at a quicker rate of working. In order to overcome the effects of friction of the sluices in lifting, due to head of water or otherwise, the roller principle devised by Mr. F. G. M. Stoney has been adopted. The course of working will be as follows:—Starting at high water, when the sluices will be open, the attendant will wait until the tide has ebbed away sufficiently, and then the three sluices will be lowered until their lower edges nearly touch the bottom, thus forming a vertical wall blocking the arches of the bridge and preventing further ebb to tide. There will, however, be a sufficient space between the bottom edge of the sluices and the river bottom to pass a volume of water equivalent to that flowing over Teddington weir. It will be seen, therefore, that, so long as the sluices are down, the level of water in the reaches above them will remain constant. When the returning flood tide brings the stretch of water below the sluices to a level with that of the reach above them, the attendant will again lift the sluices, which will remain open until the tide has once more fallen to the period of half ebb. Whilst the sluices are raised—that is, when the ebb and flow are at their highest periods, and there is deepest water in the river—the navigation will be unobstructed, craft passing under the footbridges in the usual way. When the sluices block the fairway the lock will naturally be brought into requisition. The sluices are vertical shutters when down, but an arrangement has been devised to cause these sluices to lie in a horizontal plane when raised. The method of operation may be said to consist of a curved guide, by which the ends of the sluices are

automatically directed, thus causing them to turn through a quarter of a circle as they ascend. When fully housed the sluices are, therefore, tucked away snugly overhead in the space between the two paths of the double footbridge. The advantage of this is twofold. In the first place, if the sluices were to remain in a vertical position they would detract greatly from the headway for passage of craft; and, secondly, they would form extremely unsightly features in the landscape. For the accommodation of the large number of pleasure-boats which through this part of the river in summer, inclined planes, with rollers, have been constructed. The work has been carried out by the Thames Conservancy from plans by Mr. C. J. More, the engineer to that body, a part of it being let to contract. The estimated cost was 61,000*l.*

**SEWAGE WORKS, HEREFORD.**—The Town Council of Hereford having proposed to borrow the sum of 3,000*l.* for the purpose of the sewage disposal of the city, Colonel John Ord Hasted, R.E., Local Government Board Inspector, held an inquiry into such proposal in the Council Chamber on the 18th inst. The Town Clerk stated the case for the Corporation and said that the present work occupied 64 acres. The time had now arrived when it was absolutely necessary to extend the filter-beds. The City Surveyor, Mr. J. Parker, then produced plans of the proposed extensions. He said that the existing works were situated in the Bartonsham meadows near the Eign railway bridge, and were laid out for chemical precipitation and intermittent downward filtration. The average daily flow of sewage was 14 million gallons. After giving particulars of the existing sewage disposal he remarked that it had, however, been found difficult to give the filter-beds that rest which they required in order to do their work properly; the committee therefore proposed to purchase a site containing 17 acres of land at a cost of 2,000*l.* adjoining the existing works, which readily adapted itself to the utilisation of the existing carriers from the precipitating tanks, and was also in every way suitable for the purpose. The cart-roads would be 12 ft. wide. The existing effluent-carrier from the precipitating tanks would be extended to the new filter-beds, and the whole would be underdrained at an average depth of 4 ft. 6 in. below the surface. The drains being 11 yards apart the sizes varied from 4 in. upwards, converging from the 18-in. outlet at the inspection-chamber, adjoining the River Wye, where would be fixed a tidal flap to close against flood-water, and from there iron and stoneware pipes would be laid to the river. The additional land would, apart from roads, provide 16 acres, which, added to the 64 acres already in operation, made 224 acres. The sewage of 1,000 persons per acre on such land was ample, and would provide for an increase of population of 20,000. He estimated the cost of laying out the site in accordance with the plans, sections, and specifications handed in at 1,000*l.* The Inspector subsequently visited the works at Bartonsham.

**WATERWORKS, SANDWICH.**—On the 15th inst. the Mayor of Sandwich laid the foundation-stone of the building which is to contain the pumping machinery of the new waterworks at Woodnesborough. Mr. H. Roberts is the contractor, and Messrs. Easton & Anderson are the engineers. Mr. Catt is the Borough Surveyor and clerk of the works.

#### STAINED GLASS AND DECORATION.

**WINDOW, ST. ANDREW'S CHURCH, LEYTONSTONE.**—The dedication of the east window of St. Andrew's Church, Colworth-road, Leytonstone, has just taken place by the Bishop of St. Albans. The window has been erected to the memory of the late Mark Bean, by his widow. He was interested, we are informed, in every branch of the building trade in the neighbourhood during the whole of his lifetime. The window, which is three lights, is in the style of the thirteenth century, and has been designed and executed by Messrs. Young & Marten, of Stratford, E. The two side-lights being scenes from the life of St. Andrew, in five subjects, and the centre window in three subjects, the Nativity, Crucifixion, and Ascension of our Lord.

**MEMORIAL WINDOW, GAYDON, WARWICKSHIRE.**—A new stained-glass window has been placed in the nave of Gaydon Church, on the south side. The window consists of two lights, representing the Good Samaritan and Christ blessing little children, with a quatrefoil in the top, in which there is the figure of an angel holding a scroll, with an inscription on it. The design was furnished by Mr. William Whellan, jun., acting on behalf of the firm of Messrs. F. Holt & Co., of the Stained Glass Works, Warwick, by whom the work was executed.

#### FOREIGN AND COLONIAL.

**FRANCE.**—The Minister of Public Works is in a few days to submit to the Chamber of Deputies the scheme for the Paris metropolitan railway. The Parliamentary railway committee has adopted, at its last sitting, the scheme for a tubular

tramway, devised by M. Berlier, the engineer to connect the Bois de Vincennes with the Bois de Boulogne.—At St. Lazare an exhibition just been opened of 150 drawings and engravings by Paul Renouard, intended for the Tokio Museum.—M. Faignière is executing a bust of Renouard for the Institut.—M. Desroches, the sculptor, completed the model for the bust of Delacroix for the Museum of Versailles.—An exhibition of paintings of Alfred Stevens is announced, opened shortly at the Georges Petit Gallery, the municipality of Marseilles is occupied with plans for bringing water from springs at L'Évêque, which can furnish an abundant supply for all the requirements of existence, and the result of numerous discussions, has dissolved the Durancé.—The municipal council of Cloud has resolved to proceed at once with repairing of the tower of the church, which is in a dangerous condition.—The buildings for the 1890 Exposition Universelle at Caen will be opened early next month. The "Société Régionale des Architectes de France," after six years of existence, and the result of numerous discussions, has dissolved. M. Pillet has been elected city architect of Caen. At St. Quentin the new "Halles," built from designs of M. Delmas-Azémar, Director of the Works in the town, have just been opened.—Railway stations at Tours are to be improved, united together at a cost of about 4,500,000*fr.*—Important operations are under consideration for the improvement of the Loire, the view of rendering the river navigable all seasons, and re-establishing permanently the communication by water-carriage between Orléans and Nancy.—The casino at Caen is to be rebuilt and the works to be finished in time for the bathing season of 1895.—The painter Philippe Parrot, who made a distinguished reputation as a portrait painter, died at Paris a few days ago. He had received medals at the Salons of 1870, 1872, and at the Universal Exhibition of 1876. He has exhibited this year, at the Champ de Mars, a fine portrait of Mlle. Rose Caron.

**GERMANY.**—The Lutheran church on the new platz, at Berlin, was recently consecrated in the presence of the Emperor. The church, which is built in the Gothic style from the plans of Professor Otzen, provides accommodation for worshippers, at a cost of 29,000*l.* The altarpiece of the Emperor and Empress, is decorated by the "Last Supper," executed in marble by Haverkamp, a pupil of Schaefer; the interior is adorned with statues of the Apostles by Kokolsky. The builders are Messrs. Metzing & Held. At the recent meeting of the Evangelical Church Building Society it was announced that the Emperor had granted another 1,500*l.* towards the Emperor's Memorial Church. The society has now nearly 120,000*l.* towards the cost of the church, estimated at 135,000*l.* The society has during the last five years spent 800,000*l.* on churches in the neighbourhood. Fifteen of these have been consecrated, seven will be completed next year and eight are in process of erection. The municipality of Treptow have decided to build a new bridge over the Lake of the Lagoon, so as to form another route to the Park in case the latter site be chosen for the exhibition. Mass meetings are being held in Berlin against the choosing of the Lietzensee site as a site for the exhibition. A recent number of "Moderne Kunst" gives some particulars of Professor Reucklake's new plans for the monument to the Emperor William I. at Schlossfreibitz. According to these the statue would be situated on a double terrace, the lower one, 69 metres in length, is approached by a flight of thirty-two stairs, and the upper, 15 metres, is approached by a flight of thirty-two stairs, and the stairs occupy square metres, and could accommodate over 100 persons. Statues of the Emperor Frederick III. and the King of Saxony will be placed beside that of the Emperor.—Seventeen artists have sent in one model for the competition for the monument to be erected in front of the Town Hall at Stettin. The designs are to be shortly published for inspection at Berlin. The Imperial Houses of Parliament are to be connected with the chief post-office by a pneumatic tube. The town of Schwerin is about to erect a monument to Heinrich Schliemann, the well-known archaeologist. The work will be executed by the sculptor, Berwald, the author of the Bodenstein monument at Wiesbaden.—There is to be an exhibition at Bromberg next year.—The cost of the restoration of Heidelberg Castle has been estimated at 1,000,000*fr.* It is once more explicitly stated that the restoration, except where rendered absolutely necessary by the decay of the fabric, will be undertaken.—The remains of a Roman fort at Hillersleben, north-east of Coblenz, have been discovered, and the course of the Limes investigations.

**RUSSIA.**—There will be a Russian Exhibition at Nishnevogor this summer. The sections will be: Trade and Industry, Arts and Sciences, The Ministries of War, Finance, Agriculture, and Transport will take part, and it is expected the progress made in all directions since the last exhibition at Moscow, in 1880,







W. P. McNamee .....	2502	W. Samms, Chemsford .....	
E. Saltmarsh .....	530	J. Norrington .....	
E. West .....	495		* Accepted.





WAKEFIELD.—Accepted for enlarging the St. John's Clarendon-street Schools, Wakefield. Mr. William Watson, architect, Wakefield.

Estimating, Brick, and Stonework—Flower Bros. ....	£499 0 0
Slating work—Wm. Atkinson, Leeds .....	74 18 0
Plastering—Charles Driver .....	33 0 0
Carpeting and Tiling—Henry Black .....	11 40 0
Plumbing, Glazing, and Ironwork—Saml. Atkinson .....	264 0 0
Painting—Chas. Turner & Son .....	13 7 6
	£999 15 6

[Thirty-six tenders received.]

WAKEFIELD.—Accepted for the Assembly Room at the Market Tavern, for the Wakefield Coffee Taverns Co., Limited. Mr. William Watson, architect, Wakefield.

Estimating, Brick, and Stonework—Flower Bros. ....	£661 8 6
Slating—Pickles Bros., Leeds .....	315 0 0
Plastering—Chas. Driver, Wakefield .....	55 0 0
Carpenter and Joiner—John Lund, Wakefield .....	135 14 4
Painting, Glazing, and Ironwork—Saml. Atkinson, Wakefield .....	802 5 1
Painting—Chas. Turner & Son, Wakefield .....	18 14 8
	£1,398 5 4

[43 tenders received.]

WATFORD.—For levelling, paving, flagging, &c., Westland and two other roads, for the Local Board. Mr. W. Waterhouse, Engineer, 14, High-street, Watford.

Wm. Tearle .....	£255 0 0
F. Dupont, Watford, E. Colchester .....	241 23 0
Engineer's estimate .....	269 12 0
	£765 13 0
Wm. Tearle .....	£230 0 0
F. Dupont, Watford, E. Colchester .....	223 0 0
Engineer's estimate .....	272 0 0
	£725 0 0

\* Accepted.

WILLINGTON (Co. Durham).—For the erection of a mortuary chapel at the cemetery, for the Local Board. Mr. Jno. Cooke, surveyor, 2, West End-terrace, Willington.

J. S. Craman, Willington (accepted) .....	£355 0 0
Jonathan Vickers .....	330 0 0
Thomas Hutton .....	330 0 0

WIMBLEDON.—For alterations and decorations at "Corne Hill," Wimbledon Park, for Mr. Peter Mumford, Mr. Aston Webb, architect, 19, Queen Anne's Gate, Westminster. Quantities by Messrs. Cordey & Selby.

Crosley .....	£2,443 15 9	Jno. Gibbs .....	£1,993 0 0
Nightingale .....	2,197 0 0	Parsons & Towns .....	1,042 0 0
Fox, Son, & Co. .....	2,185 0 0	Head .....	1,042 0 0
Kiel .....	2,081 0 0	Lorden & Son .....	1,885 0 0
Whitehead Bros. .....	2,080 0 0	J. G. Fraser, Wimb. .....	1,722 0 0
Harmer .....	2,062 0 0	Don .....	1,722 0 0

WIMBLEDON.—For new chancel and procession path, Church of the Sacred Heart, Wimbledon. Mr. F. A. Walters, architect, architect. Mr. John B. Lofting, surveyor.

Stimpon & Co. .... Estimate 1. ....	£1,395 0 0	Estimate 2. ....	£1,075 0 0
F. Higgs .....	7,350 0 0	1,075 0 0	
Smith & Son .....	7,477 0 0	980 0 0	
Godland .....	6,847 0 0	924 0 0	
Longley .....	6,769 0 0	973 0 0	
Lorden & Son .....	6,666 0 0	819 0 0	
F. G. Minter .....	6,593 0 0	890 0 0	

WIMBLEDON.—For the construction of outfall and erection of sector station, &c., Dunsford-road, for the Local Board. Mr. H. Cooper, C.E., Broadway, Wimbledon.

B. Cook & Co. .... Estimate 1. ....	£1,395 0 0	Estimate 2. ....	£1,379 9 0
E. H. Wimb. ....	1,379 9 0		

WITTINGTON (Hants).—For the supply of 650 yds. wrought-iron fencing and sundry gates, for the Local Board. Mr. A. H. Mountain, C.E., Town Hall, Wittington.

F. Haynes & Co. .... Estimate 1. ....	£1,180 14 11	Estimate 2. ....	£1,180 14 11
Richardson, Elson, & Co. ....	230 6 6	W. H. Wharton .....	180 12 1
J. W. Watson, Clisson, & Co. ....	215 3 6	Walker, Ltd. ....	178 0 1
E. Worrall & Co. ....	201 7 0	W. Miller & Sons .....	177 15 8
Chas. Bailey .....	214 14 11	H. H. & Son .....	175 3 3
Clark & Dickshaft .....	192 13 8	Raw and Bros. ....	172 0 1
Pickley, Sons, & Co. ....	192 6 6	H. Hall & Smith .....	161 10 8
H. H. & Son .....	192 6 6	J. I. H. Holan .....	161 10 8
W. H. Smith & Co. ....	190 14 5	W. Hay & Sons .....	161 11 2
G. H. Smith & Co. ....	190 14 5	A. F. Mitchell & Co. ....	161 11 2
G. H. Fletcher & Co. ....	188 2 8	The London & Lanc. ....	161 11 2
Francis, Morton & Co. ....	186 8 3	Mountford & Co. ....	161 11 2
Blackley & Pickering .....	185 6 0	J. J. Raydon & Co. ....	153 11 9
E. C. & J. Kea, Ltd. ....	182 11 0	Baylis, Jones, & Co. ....	153 11 9
T. W. Palmer & Co. ....	182 7 1	Hampton .....	152 17 5

\* Accepted.

WORKING.—For the erection of Wesleyan school buildings, for the Wesleyan Church, Mr. M. H. Poole, architect, Vann House, near Godalming.

I. Bull .....	£1,122 11 11	Harris & Son, Woking .....	£1,015 0 0
Ingram & Son .....	1,015 0 0		

\* Accepted.

WOLVERHAMPTON.—Accepted for the erection of house, Evan-street, for Mr. Joel Hobson, Mr. J. Mason, architect, Victoria-chambers, Blakenhall-street, Wolverhampton.

E. Hughes, Coleman-street .....	£1,197 0 0
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WOODFORD WELLS (Essex).—For alterations and repairs to the "Home and Well" public-house, for Mr. S. M. Bush, Mr. G. Ford, S. Wright, architect, Woodbury-road, Forest Gate. Quantities by Mr. Geo. Francis, 20, Finsbury Circus, E.C.

Watson .....	£279 11 11	Arber .....	£279 11 11
Wordley .....	250 0 0	Green & Smith .....	250 0 0
Harris & Wardrop .....	243 0 0		
	£772 0 0		
Watson .....	£179 11 11	Arber .....	£179 11 11
Wordley .....	179 11 11	Green & Smith .....	179 11 11
Harris & Wardrop .....	179 11 11		
	£538 0 0		

\* Accepted.

WORSBROUGH (Yorks).—For the construction of a river wall, for the Local Board. Mr. Jno. Whitaker, surveyor, Saville House, Worsbrough.

H. Burrows & Son .....	£281 11 11	Higham & Porter .....	£281 11 11
Duncan & Jones .....	270 0 0	W. H. Guest, Worsbrough .....	270 0 0

\* Accepted.

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THE ANCIENT CATHEDRALS OF IRELAND. 1894.

1. St. Patrick's, Dublin	2. Christchurch, Dublin	3. Kilkenny	4. Drogheda	5. Down	6. Carrickmacross	7. Carrickmacross	8. Carrickmacross	9. Carrickmacross	10. Carrickmacross	11. Carrickmacross	12. Carrickmacross	13. Carrickmacross	14. Carrickmacross	15. Carrickmacross	16. Carrickmacross	17. Carrickmacross	18. Carrickmacross	19. Carrickmacross	20. Carrickmacross	21. Carrickmacross	22. Carrickmacross	23. Carrickmacross	24. Carrickmacross	25. Carrickmacross	26. Carrickmacross	27. Carrickmacross	28. Carrickmacross	29. Carrickmacross	30. Carrickmacross
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# The Builder.

VOL. LXVI. NO. 2678.

JAN 2, 1894.

## ILLUSTRATIONS.

Ancient Cathedrals of Ireland: III., St. Canice, Kilkenny.—Drawn by Roland W. Paul	Double-Page Ink-Photo.
Plan, Cathedral of St. Canice, Kilkenny.—Drawn by J. C. Heriot	Double-Page Photo-Litho.
Decorative Painting: "Victor Hugo Offrant Sa Lyre à La Ville de Paris."—By M. Puvion de Chavannes	Double-Page Ink-Photo.
Decorative Painting: "Triomphe de L'Art."—By L. Bonnat	Double-Page Ink-Photo.

## Blocks in Text.

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### French Art in 1894.



THE aspect of the two great Paris exhibitions this year certainly goes to confirm the opinion that has been more than once expressed in our columns as to the bad effect of the division of the French painters into two rival camps. We say the painters more especially, because in fact the schism hardly seems to affect the sculptors and architects, nearly all of whom continue to send their works to the old Salon. In the Champ de Mars Salon the small collection of sculpture only includes two or three works of real interest—some decorative work by M. Injalbert, a pathetic study by M. Saint-Marceaux ("La Faute"), and "Le Sommeil de Leda" of M. Mulot—a work to drive the "British Matron" to frenzy; and in architecture there is hardly anything that can be said to be of interest, if we except a model by M. Henri Chaine of a new form of iron roof for domes. It is in the matter of painting that the two Salons are divided mainly, and the results are manifestly unfavourable to both exhibitions. There can be no doubt that the exhibition at the old Salon is much below the average, when taken as a whole. It contains of course a good many fine works, but the proportion of poor and uninteresting pictures which are hung is certainly on the increase, the immense range of galleries being filled as full as usual, with the loss of that proportion of fine works which is to be found in the new Salon, and which would otherwise occupy part of the space at the Champs Elysées now occupied by inferior works. On the other hand it cannot be questioned that the Champ de Mars Salon itself is going down deplorably. During its first years, when there was a stronger *esprit de corps* operating in its favour among those who had rebelled against the old Salon, it contained a large proportion of fine works mingled with a considerable amount of mere eccentricity; but now the eccentricity is getting the upper hand, and the long walls of its principal galleries are

"Thin sown with aught of profit or delight," and diversified not seldom with things which are simply hideous. All this is melancholy to see, and things are not likely to improve as long as this effort to keep up two rival Salons

is persisted in. Wonderful as is the energy and vitality of her artists, Paris cannot support two annual exhibitions on such a scale as these, and the sooner this fact is admitted and acted on the better.

Decorative painting on a great scale occupies a considerable place at the old Salon, and at the new Salon the work which mainly redeems the exhibition from mere mediocrity is the very large painting by M. Puvion de Chavannes intended to decorate the ceiling of the "Escalier du Préfet" at the Paris Hôtel de Ville. We publish a lithograph of the centre or flat portion of this, the subject of which is "Victor Hugo Offering his Lyre to the City of Paris," and we give also an illustration of the ceiling painting by M. Bonnat, "The Triumph of Art," exhibited at the old Salon, and intended also for the Hôtel de Ville, for the room called the "Salon à Arcades," but otherwise known as the "Salon des Arts." The two works are rather typical of the respective tendencies of the two exhibitions, as illustrated in their best aspect. At the old Salon the ideal of the easel-picture prevails; the style of picture which is painted more or less realistically and worked up with strong effects of light and shadow and a liberal scale of colour: at the new Salon the favoured style is that which appertains rather to fresco painting, with a comparatively flat treatment and a low scale of colour. In M. Bonnat's picture the energy is somewhat overdone both in regard to design and colour; the horse is too ostentatiously rampant, and his cream-white shape is relieved against the dark purple shadows on the clouds in a manner which is forcible enough, no doubt, but somewhat too pronounced for decorative painting. In fact, the whole thing is a great easel picture transferred to a ceiling. Only in one sense, as a matter of design, is it better suited for a ceiling position than the painting of M. Puvion de Chavannes, in that there is a more floating movement about it, and it could accordingly be seen from different positions below without suggesting that difficulty about the "right way up" which is the great drawback of ceiling paintings. In M. Puvion de Chavannes' far more calmly composed and really decorative work, this difficulty about the "right way up" is frankly ignored; the figures stand on the ground in the ordinary manner, and consequently from one side of the room the whole thing must be seen entirely the wrong way up. This is the first time, we believe, that M. de Chavannes has been induced to meddle with a ceiling painting; his experiences have hitherto been on vertical walls; and just as in point of

style M. Bonnat's work is an easel picture misplaced as a decorative picture, so in point of design M. de Chavannes' painting, perfectly decorative in style, is a wall decoration transferred to a ceiling, and will always, we fear, produce that impression. The decorations of the large cove which supports this central flat portion of the ceiling are equally admirable in decorative style, and have the additional merit of falling into the right place as design; they consist of four groups symbolising "Patriotisme," "Charité," "Ardeur Artistique," and "Foyer Intellectuel," filling four spandrels; and groups symbolising "Espérance," "Fantaisie," "Beauté," "Intrepidité," "Culte du Souvenir," and "Urbanité," occupying six tympana in the heads of arches. These subsidiary subjects are full of grace and fancy.

The old Salon contains some very large works in decorative painting, besides that of M. Bonnat. Of these the most important is M. Fournier's immense canvas, "Les Gloires Lyonnaises," intended for the general council room of the Hôtel de Préfecture at Lyons. It is a collection of portrait figures of eminent natives of Lyons. The modern men, including Meissonier, Ampère, and many other well-known names, are grouped in the foreground, which includes the men of this century, the earlier figures being on the left, the portrait of Marshal Suchet on the left forming a kind of appropriate balance to that of Meissonier on the right. The Mediaeval and still earlier figures complete the circle in the middle of the picture, Marcus Aurelius forming the centre figure. The composition is flanked by a Classic order on each side, the whole height of the picture, which forms a frame to the view of the Gulf of Lyons in the background. A key to the portraits is given beneath. The picture attracts much attention, and may be considered a great success, as it combines the interest of portraiture with a really fine total effect. The various kinds of subjects which may be decoratively treated are shown in other works with rather amusing variety. "La Couronne de Toulouse," by M. Debat-Ponsan, a ceiling for the Hôtel de Ville at Toulouse, is one of the true class of ceiling paintings, in which the figures float rather than stand; it consists of a collection of figures, nude or brightly draped, symbolising the various arts, and is an excellent example of its class, as it is a kind of composition exactly suited to a ceiling, and which, in fact, looks out of place when hung, as it is at present, on a vertical wall. M. Léon Comerre's "La Rhône et la Saône," a decorative picture for the Préfecture of the Rhône, is one of the old classic school, in which the Rhône, a bearded Neptune-like



figure, is seated on rocks, and the Saône appears as a female figure floating down on the stream to the junction of the two rivers. The canvas is not very well filled up, and the colour is cold. Mr. Bridgmann exhibits, for the first time we believe, a large decorative work of fine design and sentiment, "La Musique du Passé," called "Panneau Décoratif pour un Hôtel," in which a group of Greek-looking figures are listening to Egyptian harp-players, a treatment which enables the artist to turn to account his exceptional knowledge of Egyptian costume and detail. In a decorative sense the picture may be considered a very fine one. M. Berteaux exhibits a work on a smaller scale, "Paris en Fête, 1893 (France et Russie)," intended for the Galerie Lobau at the Hôtel de Ville, and which is a clever attempt to produce a decorative effect from the treatment of a crowd of boys in half light, flying Chinese lanterns; it seems hardly serious enough for a permanent decoration in a public building. Another variation in decorative subjects is M. Escalier's "Galanterie: panneau décoratif," a palace garden scene with balustrades and trees and a part of a building in the background, with two or three foreground figures; the artist has succeeded in producing a decorative effect without entirely losing the feeling of landscape. The largest of all the decorative works exhibited is "Venite ad me omnes," a religious painting by M. Monchablon, a pupil of Gleyre; it is not a "Christus Consolator," however, as the title would imply, but an apocalyptic picture treated in a very flat style and somewhat like a huge illumination, representing Christ enthroned in the centre, the elders and the evangelistic symbols grouped around, and the seven churches as very beautiful kneeling figures in the foreground, each holding a model of a church; by a very pretty artifice, in order to group these seven figures symmetrically, the artist has represented one of the figures as rising up towards the throne in a kind of ecstasy, holding up the model on high, so that the other six form a kneeling group of three on each side of the centre. This is ecclesiastical art, with the limitations implied by that adjective, but it is a fine example of its kind.

It is in the old Salon more especially that we find the majority of that class of pictures which depict incidents merely, and too many of which, like M. Le Dr'u's "Episode du Siège de Lille," arouse only a curiosity as to what is the point of the story represented, and when one has ascertained that, most of the interest of the picture has evaporated, except where the subject has been treated with a force which gives it a dramatic interest for its own sake. M. Detaille exhibits a huge "incident" picture, "Les Victimes du Devoir," a scene during a fire at night in the streets of Paris, where some firemen who have been killed in the execution of their duty are carried through the crowd. This picture is obviously very popular, but we do not think many artists will think it worth the space it occupies, or the result commensurate with the ability displayed in its execution. There are a certain number of Napoleonic pictures; the well-known interview between Napoleon and the Pope, where the former went into a piece of acted diplomatic passion, and the Pope addressed him sarcastically as "Farceur!" finds an illustrator in both Salons; in neither case with much success. But a small picture of this class really worth attention is M. Kratké's "Campagne de France, 1814," a cottage interior into which Napoleon has stepped *en route* to warm his feet at the fire, two or three officers standing respectfully by the door, while through the window are seen the rows of figures of the soldiers pressing on their march, bending forward in the action of walking laboriously through the snow. The charm of this small picture is its absolute reality; it is like a day of the campaign brought back to one. M. Demont-Breton has an interesting study of a bit of old Dunkerque life in her picture of "Jean Bart" (in 1674) persuading the fisher-

men to enrol themselves; also a painting in which the charm lies not in pictorial effect so much as in the air of reality imparted to it, and which is just what is so often wanting in this class of historic pictures.

The old Salon is not wanting, however, in some fine figure paintings of the ideal order. M. Gervais' "Jugement de Paris" can perhaps hardly be called in one sense an ideal treatment of the legend, for the goddesses are very like modern ladies, but there is a kind of poetic glamour about the whole scene, arising mainly from the rather unreal and yet very rich and beautiful colouring, and altogether it is a remarkable work, if not rising to the height of its subject. The degree of poetic feeling which may be imparted to a nude study is finely shown by M. Raphaël Collin in his "Eveïl," a kind of dream nymph who has just risen from the ground and is stretching her arms as just awakened; the colouring both of the figure and of the foliage which forms its background is kept back, as it were, from the plane of realism; the whole forms a harmony of colour which is unlike nature and yet seems all in keeping with the general ideal of the painting. It is interesting to contrast with this such a picture as M. Caire's "Fumeuse," a woman reclined on a rug with her back to the spectator, smoking a cigarette; a picture vulgar in idea and yet redeemed from vulgarity by its splendid broad execution; real flesh and blood on canvas; in this again how different to M. Wencker's staring and hard "Nympe Chasseresse;" neither the beauty of ideal or of execution. M. Bouguereau is as pretty, as finished, and as academically correct as usual in his "La Perle," a life-size nude figure kneeling and as if emerging from a gigantic shell; the title of the picture giving the excuse for the pearl-like flesh tints. Pretty and nothing more, however, is the word for this; it professes a sentiment, but it is sentiment of the weakest order, and on the whole one prefers a mere nude study in a more powerful though realistic style, such as M. Caire's just mentioned, which makes no false appeal to sentiment.

Among other paintings of ideals is a rather fine one by M. Berthault, "Réveil," a floating figure rising from shadow to light, grouping with a second one blowing the trumpet of Dawn. M. Henri Martin, who used to be one of the most remarkable contributors of pictures with a meaning or allegory, seems to have rather lost his energy and has gone into single-figure studies with effects of light, like his "Douleur," a heavily draped and veiled figure going through a wood with a lantern; a picture which certainly does not represent the best which its author has done or might do.

Hospital pictures and surgical operations seem to have at last palled, though in place of them M. Harris, an American-born artist residing in Paris, who seems to have imbibed the taste of the Paris picture-gallery crowd for horrors, gives us a very large painting of "La Loi d'Honneur," in which a wronged husband has shot a man whom he has surprised with his wife under circumstances leaving no room for explanation, while the wife is trying to hide behind the dressing-table. Anything more vulgar and blatant than this large picture, in the artistic and in every other sense, one could not conceive; but it receives the homage of much attention. A more healthful departure in realistic painting seems to be a taste for workshop scenes, two or three of which are very well and thoroughly executed, though mostly totally wanting in what may be called pictorial value; they are simply clever transcripts. One of these labour pictures, "Une Forge," by M. F. Cormon, shows rather more of artistic power, and this has been purchased by a patriotic Government.

It is exceedingly difficult to form an estimate from the Salon pictures of the real vitality of French landscape at present, because landscape paintings, which are mostly on a scale of moderate size, get so

completely overborne and crushed by the crowd of large and more or less violently painted figure and *genre* pictures amid which they have to find place. One can form some estimate as to this by comparing the effect of Mr. Brett's "Pearly Summer," which is hung at the Salon, with our recollection of its effect on the walls of the Academy, where it appeared as a large picture with a powerful effect of sunshine; here it seems quite a small one, and the sunshine seems half crushed out of it.\* It is well hung, however, and is balanced by one of the best French sea pieces in the galleries—M. Max Bouvet's "Lever de Lune." One is led to think, however, from this example, that a good many of the landscapes in the Salon which impress one as rather of second-class interest, would produce a very different effect in other surroundings. They would certainly have a much better chance of showing at their best if two or three of the galleries were devoted especially to landscape, apart from the figure paintings. One thing which strikes one in the landscapes of the year is that there is less of that cold, grey, sunless way of representing Nature which was so prevalent recently; some sunshine has come into French landscape, and we find various brightly-painted scenes, such as M. Bourgeois' "Chemin de la Presnaye," M. Carl Rosa's "En Novembre," a Seine picture in which the foreground bank is perfectly rendered; M. Dupré's "Une Prairie à Arches," M. Grivolat's "Les Roches Fleuries," a brilliant riot of wild roses and sunlight; M. F. E. Michel's "En Forêt," a fine study of forest foreground; M. Mosler's "Sous les Pommiers," an orchard scene with a cow standing under the shade of a large tree, which, simple as the subject is, has the merit of real pictorial character. The new Salon contains still better examples in such works as M. Courten's "Sortie du Troupeau" and M. Lemaire's "Derniers Beaux Jours," and M. Eliot's "Le Soleil dans les Arbres," which does justice to its title. On the other hand, we find paintings such as M. Denduyts' "Le Ciel Bleu dans le Bois," in which the sky is like blue paint, but not like atmosphere, or M. Fath's "Un Sentier sous Bois en Mai," which is all paint and nothing else. The want that we find is the want of what may be called the sentiment of landscape; M. Moteley's "Prairie dans la Vallée de Clécy" is one exception; this is a fine landscape with something Turneresque about it; but this "Turneresque" quality is rarely seen in French landscape, and the works which have most force and individuality generally have least of it. M. Quignon's "Blés en Fleurs," for instance, is a masterly painting as a carefully-studied representation of natural fact, and in that sense one of the most "thorough" landscapes in the galleries; but there it seems to stop. We find more of the sentiment of landscape in some of the small works in the new Salon, those of M. Iwill and M. Jettel, for instance; not very powerful works in point of execution, but they are redeemed by a certain feeling which is wanting in the larger and more ambitious landscapes of the old Salon. As to sea painting, with few exceptions our neighbours are no nearer to it than ever; Britannia still rules the waves in that sense at all events. The majority of the sea pieces, at least the representations of rough sea, in both Salons, are dead failures; some of them are quite absurd, and seem as if painted from description by people who had never seen the sea; Mr. Henry Moore's picture in the new Salon is enough in itself to throw the whole of them into the shade. M. La Villette's "Marcé Montante à Quiberon" is an exception; that is a good sea; and so is that of Mr. Robinson's in which "Une Nympe de la Mer" bathes her feet, but here the painter is an Englishman,

\* Mr. H. W. B. Davis's exquisite little painting, also, in the second room at the Academy last year, seems utterly killed in the company in which it is hung in the new Salon; but for recognising it, we should have passed it over.



whose natural perception of the sea has not apparently been dulled by Paris training. In the treatment of calm sea there are some fine and luminous works, such as M. Duthoit's "Angelus en Mer," and several pictures commemorating the arrival and departure of the Russian fleet are very good examples of maritime subjects. As long as the sea is calm, in fact, our neighbours can make something of it; it is when it gets rough that it appears to be too much for them.

Portraiture is not very strong this year in either Salon; there are some very good examples in the old Salon, but none that remains in the memory as a really remarkable work; and in the new Salon M. Carolus-Duran is rather quiescent, and has none of his imposing full-length portraits this year, only some bust likenesses, of which "Mme. B." is the finest. It is of some interest to notice, however, that this painter is showing symptoms of taking up other subjects than portraiture, and exhibits a sketch for a crucifixion scene, and a couple of landscape studies. We presume he "advanced" school of critics will tell us that Mr. Whistler's portrait of the Comte de Montesquiou-Fézensac is the portrait of the year. We can only see a figure about ten heads high, with a colourless pasty face, which nothing but absolute infatuation could accept as a fine picture. Among other artists who represent the new Salon tendencies, M. Dagnan-Bouveret sends several good portraits, though he is hardly at his best. M. Aublet's charmingly-finished fantasy entitled "Au Matin" is somewhat superficial and conventional, but exquisitely complete in its way. M. Besnard rather takes the grand out of the hand of Carolus-Duran by his brilliant "Portrait of Mme. B.," in orange silk with a blue marble mantlepiece forming part of the background, but kept very subdued in colour; conveying the effect of the colour in shadow rather than the colour itself; a fine and harmonious work in spite of its bold colour-scheme. M. Lérad, whose style belongs much more to the old than the new Salon, is overworking his invention of bringing the figure of Christ into contact with subjects of modern life; the effect was striking at first, has become hackneyed and rather stagey now. M. Mathey's portraits, and those of M. Jervex, and his nude study "Le Bain," are new; and one more decorative painting may be mentioned, a scene in Paris in 1258, by F. Delance, representing the syndics of corporations attending before Étienne Boileau to assist in the getting up of the "livre des métiers;" this is hardly decorative except in the sense that it is flatly treated, but it is interesting as an evidently conscientious attempt to realise the men of the thirteenth century as they actually may have been, in physiognomy and costume.

Sculpture exhibits at the old Salon are as numerous as usual, and include a good many good works, but sculpture also is not equal in interest to the collections of some previous years. M. Mercier does not exhibit, M. Delguère only exhibits a bust; and instead of one of his fine ideal figures facing the main entrance as usual, we have M. Prémiet's portrait figure of Meissonier, in tight trousers and top-boots; clever and characteristic enough, but certainly not sculpturally beautiful. There are, however, few of the eccentric and grotesque experiments which sometimes form blots on a sculpture collection; the standard of taste and effort is high, and there are some figures and groups of great beauty and purity of style, such as M. Demaillé's "Amour" (the property of the Corporation of Paris); M. Dubois's fine group "Le Pardon," which is being purchased by the State; M. Annaux's recumbent figure of "Orphée"; M. Lemaire's beautiful seated memorial statue of "Princesse Marie d'Orléans"; M. Louvier's "La Victoire," a monument to commemorate the centenary of the raising of the siege of Dunkerque; M. L. Morice's bas-relief figures representing "Music" and "Painting"; M. Pézioux's charming figure

of "L'Écho Enchanté" (purchased by the State); M. Puech's "La Seine," also purchased by the State (happy sculptors who live under so recognisance a Government!); a recumbent figure with a bas-relief of the City of Paris in the background; and M. Charpentier's charming bronze figure "Les Adieux d'une Hirondelle," in which the female figure symbolises the swallow. Patriotic monuments are not wanting; M. Carlés' "Au Champ d'Honneur" for example, in which a winged figure urges on a soldier; and M. Cordonnier's monument to Testelin, organiser of the "défense dans le Nord" in 1870-71: this is an important monumental work, consisting of a central column and bust, in front of which is a spirited group of soldiers, while a winged figure hovers behind. One of the worst, because most unsculpturesque, things in the place is M. Lami's "Danseuse," a ballet-dancer in short skirts, yet this seems to be the popular work of the year, if one may judge by the fact that it is one of the few of which photographs are plentiful; a melancholy indication that popular perceptions in sculpture are not much better in France than in England.

The "Société des Artistes Indépendents," who have been holding their exhibition in the "Pavillon des Arts Libéraux" at the Champ des Mars, were polite enough to send us a special invitation card for their exhibition, but we fear the kindest return we can make for the compliment is to decline any remarks on the collection.

#### THE FEVER HOSPITALS' COMPETITION.

THE Metropolitan Asylums Board propose to build two fever hospitals for five hundred beds each, one to be built at Tooting Graveney, to be called for distinction the "Fountain Hospital," the other at Hither Green, called the "Park Hospital." The instructions to architects for the two are identical; and the drawings are now on view in the rooms of the Imperial Institute. The names of those to whom first, second, and third premiums are awarded are given in the usual form under the head of "Competitions," on another page of this issue.

Mr. Waterhouse has acted as assessor in the competition. The instructions to architects, admirably drawn up, were so full in detail that there was really not much left to the judgment of the competitors except in regard to the best method of placing the buildings on the site, so as to ensure the most effectual isolation of the wards and the most convenient and economical planning of the whole for working and administration. The number and nature of the drawings to be submitted has been distinctly specified in the instructions, as it always should be in every competition. The premiums given in each case are 200*l.*, 150*l.*, and 100*l.*; the amount of the first premium to merge in the architect's commission if the plans are carried out. This is the only fault we have to find with the conditions; it is a common one, but one which in the proper interests of the profession we shall never cease to protest against. In every such case the working drawings must almost inevitably be made over again *de novo*, and the amount paid as a premium is not a penny too much to compensate for the labour and thought involved in making the preliminary drawings. The wards required are sixteen scarlet fever wards of twenty beds each, and sixteen small wards of two beds each; eight diphtheria or enteric fever wards of twelve beds each and eight small ones of two beds each; four isolation wards of one bed each and eight isolation wards of four beds each. Small infirm wards are also required in connexion with each department. Added to this, of course, is the usual accommodation for medical staff, administration, nurses' rooms, and laundry, cooking, and stores; also receiving rooms and discharging rooms, with

bath rooms and rooms for dressing and undressing attached.

The following general recommendations were included in the instructions:

"The administrative buildings should be situated as centrally as can be arranged, and convenient of access from the entrance, but so that persons only having business from the outside need penetrate as little as possible into the hospital area."

Subject to the above considerations, the buildings should be so disposed on the site as to ensure:—

1st. That each set of wards, with the accessories attached thereto, should be isolated.

2nd. That air should freely circulate round each block of buildings.

3rd. That the ward walls should be exposed to sunshine to the fullest practicable extent.

4th. That the airing-courts or playgrounds be accessible from each block, and be sheltered from north and east, but freely exposed to sunshine.

5th. That parallel buildings should be distant from each other at least twice the height of the building measured to the eaves when the roof is flat; or measured to half the height of the roof when its pitch is above 30 deg. from the horizontal.

6th. That the ground surface of the airing-courts and the surface between adjacent buildings occupied by sick should be protected from damp.

7th. That there should be easy and direct access between the several parts of the hospital."

It will be evident from the general conditions that the object should be to keep the administrative buildings as central as possible, and to keep the scarlet fever wards, as dealing with the more infectious form of disease, as far away as possible from connexion with the entrances and the public roads, and also separate from the site of the enteric fever wards.

The two sites are rather similar in general outline. Each of them roughly approaches the form of a rather obtuse-angled triangle with a rounded angle at the apex. Nearly all the competitors have adopted two-story wards, the ground floor wards being all built on arches so as to allow of the free circulation of air under them, this being one of the conditions.

Taking the Park Hospital first, the plan (No. 19) by Mr. E. T. Hall, to which the first premium has been awarded, is an exceedingly compact one, and the several departments are both well separated from each other and conveniently connected with the administration, which occupies a wedge-shaped area with the scarlet fever wards to the right and parallel with its right side, the wards being placed at an angle running nearly north and south, so as to have the east and west sun. The enteric fever blocks are placed to the east or opposite side of the administration site, parallel with that side of it and therefore at a different angle from the scarlet fever blocks; running nearly from north-west to south-east. They could hardly be arranged otherwise without inconvenience and waste of space, though of course if one aspect is best for sunlight an ideal plan would be one in which in all the wards were orientated the same way, and some competitors (No. 9) in the Fountain Hospital competition, for instance) have obviously aimed at this, though not without attendant disadvantages of another kind in regard to laying out. It may be a question whether, since the wards are narrow, and the sun can shine through them, an aspect with the long side to the south is not preferable to one with the long sides lying east and west; there is something, however, to be said in favour of either plan. The isolation wards are properly placed in the far rear of the site, south of the scarlet fever wards. The arrangements for intercommunication are very well planned, and make the lines of corridor as short as can well be consistent with proper isolation of the departments.

No. 7, by Messrs. Leonard Stokes and G. T. Hine, adopts the theory which we have just suggested, that whatever aspect is considered to be the best for one set of wards must be the best for all. The main lines of communication form two sides of a large triangle, within which, and filling up the base, are the administration buildings, and the wards all branch out obliquely from the two



main lines of communication, or, rather, they are all perpendicular to the base of the plan, or nearly so, while the traffic lines are oblique, so that the whole two sets of wards, the scarlet fever wards on the one side and the enteric fever ones on the other, are approximately parallel with each other. This appears to us the more correct theory, and on the whole it does not appear that there is much to choose between this plan and the first premiated one, except that it is somewhat less compact. It may be a question whether the receiving and discharging departments should be placed in such close contiguity with each other as they are in this case.

No. 22 (third premium) by Mr. C. W. Henman, also places all the wards in a parallel direction, but the plan is treated in a more rectangular fashion, which looks very symmetrical on paper, but is not so compact in regard to intercommunication as the other two; the scarlet fever wards especially are partially divided by a break in the corridor. The angles of the wards are canted, which we prefer to square angles. In the discharging department it is to be observed that the room for friends waiting opens separately to the outside of the building, the discharged patients emerging by another outer door contiguous to it; this appears preferable to having a door of intercommunication between the patients' dressing-room and the friends' waiting-room, as is the case in some others of the plans. This is a very well-prepared set of plans, though we do not think the general arrangement so good as the others; and the author has given a great deal of attention to the subject of ventilation; we should say authors, for though the plans are sent in in the name of Mr. C. W. Henman of London, we understand that Mr. W. Henman of Birmingham, architect of the Birmingham Hospital, has also been concerned in them along with his brother. The system of ventilation is intended to be entirely by propulsion, and the important point in connexion with it is that a system is proposed of straining the air as it passes out of the wards, so as to catch all germs that might communicate infection into the air. If this can be effectually done, it is a very important improvement, as it must minimise the danger of the spread of infectious disease from a hospital, a fear of which is one of the reasons why the neighbourhood of a fever or infectious disease hospital is so much objected to and fought against in every district in which it is proposed to place one. Mr. W. Henman has had a number of very carefully-conducted experiments carried out with the view of ascertaining how far germs can be filtered from the atmosphere by screens of cocoa-nut and manilla fibre kept damp with carbolic acid, and it is stated that the results have been highly satisfactory, under comparatively unfavourable conditions, as the air was propelled much more strongly against the screens than would be the case in ordinary mechanical ventilation. The following is the description in the report of the process of ventilation proposed:—


"In the roof space above the entrance corridor, to each block of wards, a chamber is formed with openings at the outer end where air is admitted and drawn through a screen, kept moistened with water, by which it is cleansed of smuts, dirt, and insect life and purified of micro-organisms. In cold weather it is warmed by steam or hot-water coils to any required degree, and by means of a rotary fan, turned by an electric motor, it is forced onward through a duct running the whole length of the building and diminishing in sectional area as it advances. The purified air is admitted to the wards, &c., along the centre of the ceiling and distributed throughout each apartment by means of a spreader; so that doctors and nurses will constantly be in a pure and changing atmosphere which, immediately it passes over a patient, will be expelled through a spring screen, placed at the head of every bed, and kept moistened with a disinfecting fluid, practically harmless to human beings, but known to be capable of destroying disease germs. The again purified air will then pass up flues, in the outer walls, into a roof duct, increasing in sectional area towards the outer end, where it will discharge into the open through valved and louvred turrets, constructed so that the outflow will not be affected by movement of the outer atmosphere."

As the Committee have reserved to themselves the right to adopt any feature out of either of the premiated designs not carried out (we hope not without some extra compensation to the author), they might well give some attention to this important suggestion.

In the case of the Fountain Hospital, as before observed, the problem is very much the same as in the Park Hospital. In No. 16, by Mr. A. H. Tiltman, which receives the first premium, the enteric wards are placed at each side of the administration buildings, on the front portion of the ground and parallel to the entrance side; the scarlet fever wards are in the rear portion, well isolated, and running in the direction at right-angles to the others nearly north-west and north-east. We must again recur to the point that as one direction in regard to the sun must be the best, whatever orientation is best for one set of wards is best for all, and that the plan should determine the best position in this respect and be arranged so that all the wards can be faced the same way. This point is just missed in No. 5, the third premiated design, by Mr. Emerson, in which the lines of communication are admirably laid out, the main corridors going round the administration buildings in an approximate semi-circle or rather horse-shoe shape, and the whole of the wards branching out from this corridor. Of course it may be said that the scarlet fever and enteric wards are not on such a system sufficiently separated; apart from this the scheme is economical for administration, and leaves, perhaps, the largest open spaces of ground, but the defect remains that the wards are practically radiating, although not brought close up to the centre; and it would have been so easy, on the same scheme of planning, to have placed them all in the same direction (or nearly so) merely by a little modification in the mode of connecting them with the main corridor. In the second premiated design, No. 23, by Messrs. Beeston and Burmester, the administration buildings are kept very much more to the front than in any of the others, instead of wedging in between the ward blocks; the majority of the wards are built in the same direction (approximately at right-angles to the front), the diphtheria near to the administration, the scarlet fever at the back of the site; the details are well planned, and the whole set of drawings very carefully got up. The defect of the entirely front position of the administration buildings is, of course, want of concentration in the working.

We may have more to say on the subject when there has been time to go more fully into the details of the various schemes, as the erection of fever hospitals on this scale is a very important piece of sanitary work.

#### NOTES.

 We are very glad to see that a protest has been made by the Institute of Architects against the threatened infliction on us of a mere engineering structure of steel in the shape of the proposed new Vauxhall Bridge. A deputation from the Institute waited on the Bridges Committee of the County Council last week and explained their views, urging that the bridge should be a simple and dignified architectural structure in stone. Although the new bridge was talked of long ago, the former Bill for it was withdrawn in August last year, and the Council are now seeking for fresh powers, so that there is every excuse for opening the subject afresh and putting aside any former designs. The County Council might well take a precedent from the recent example before them of the fine stone bridge at Putney, which has met with universal approval. We may also commend to their notice a quotation from the conditions for the competition for a new bridge at Buda-Pesth, which is a fine example of the spirit in which such an undertaking should be entered on:

"The bridges should be built not only in a substantial manner and correct from a technical point of view, but also in accordance with the demands of art, it being understood that they should not only serve as a means of communication but also should hold a dignified place amongst the most remarkable structures in the capital and Royal Residence of Hungary." That is the spirit in which a great city should go into work of this kind. A bridge over a large river may be, like London and Waterloo bridges, a noble architectural monument, or it may be, like those of Blackfriars and Hammersmith, a lasting offence, annoyance, and vulgarity. It rests mainly with the County Council whether the new Vauxhall Bridge shall come into the category of new beauties or new uglinesses of London. It is surely worth their while to give some consideration to this point.

THE festivities and rejoicings occasioned in Manchester and Salford by the formal opening of the great Ship Canal last week, have been quickly followed by a "Report," which will give pause to the local enthusiasts and to the ratepayers whose money has been so freely advanced for the completion of the Canal. This report is one which has been prepared by Mr. G. H. Hill, the Engineer to the Manchester Corporation, and submitted by him to the Lord Mayor of that city. The most optimistic shareholder or ratepayer cannot but lose some of his confidence and hope, as he considers this lengthy and intricate document. It is still another but half-smothered cry for more money. In February of this year the Traffic Committee of the Canal recommended that prompt and earnest efforts should be made by the Executive Committee to carry out a formidable list of works, — buildings, cranes, grain — elevators, roads, railways, wharves, docks, tanks, silo, fire appliances, lighting, salvage steamer, coal-tips, salt-tips, dredging, jetties, pontoon, &c., &c., &c. The executive committee was powerless to execute such a number of works, which would have cost another million pounds, while the funds available did not amount to half that amount. Indeed, Mr. Hill estimates that the funds available for such works amount to only 450,000*l.*, and, as he considers that of this at least 250,000*l.* should be kept in reserve for contingencies, the sum of 200,000*l.* only remains. The traffic committee accordingly modified its too-ambitious scheme and submitted an amended list of works which were in its opinion "most urgently required and absolutely essential for traffic now being negotiated for and in course of development." These works are estimated to cost 443,000*l.* In addition to this expenditure, more money will be required for the execution of "deferred works," *i.e.*, works which have been included in various Acts of Parliament, but which have not yet been carried out; among these may be mentioned docks at Runcorn, Warrington, and Ordsal, railway at Warrington, and hydraulic lift at Barton. Truly the Manchester Ship Canal Company is not yet out of the wood, and the Manchester Corporation cannot be sure that it will not have to dip its hand still deeper into its pocket. The report makes no mention of the traffic receipts during the last five months, nor of the working expenses during the same period. This silence is unfortunate, as it gives countenance to the opinions which are now so freely expressed, that the canal is, from a monetary point of view, a huge failure.

IT would evidently be greatly to the advantage, both of the railway companies and the traders, if the Railway and Canal Traffic Bill were proceeded with without delay; for it was stated in the House of Commons last week that there are thousands of accounts still outstanding which are awaiting the passing of this Bill.



before any settlement can be arrived at. The inevitable retirement of Mr. Mundella from the Board of Trade may, perhaps, account for the delay in fixing a date for the second reading; for Mr. Bryce will assuredly find the solution of the railway rates problem no light task, and that it will take some time to gather up the threads of this complicated business. The measure which he has to take in hand is certainly a short one, but if passed into law it will, everybody will hope, prove effective. A rather singular incident in connexion with this subject occurred in the House of Commons last week. Upon the introduction of the Rates and Charges Bill of a small Railway Company, Mr. Morton moved its rejection "in the interests of the trading and agricultural community," on account of the maximum rates proposed to be charged. But after Mr. Morton had spoken very eloquently and forcibly in support of his objection, it was explained by the Secretary to the Board of Trade that the actual effect of the Bill was to reduce existing powers of charging.

FROM the *Berliner Philologische Wochenschrift* (May 26), we learn that Dr. Waldstein has found at the Heraion, in the lowest stratum of the excavation, a layer of small objects of genuinely Egyptian fabrication. They are mostly of porcelain, and among them is, e.g., a small lion with a hieroglyphic inscription, several cats, the god Bes, Egyptian scarabei with cartouches said to be of Thutmes III. and Amenophis. These vases must, of course, have been imported; they are all of small size, so Herodotus was clearly not drawing on his fancy in the charming picture he has left us in Book I. of the Phœnician bazaar, held in the bay of Argolis. Instances occur of the adaptation of these foreign wares to home use—e.g., a scarabeus is used to decorate a hairpin. It is hoped that the find will shortly be published, as Dr. Waldstein was unusually prompt in the issue of his first instalment of the Argos discoveries. The same number of the *Wochenschrift* contains a curtailed account of Dr. Winnefeld's paper, read before the Archaeological Society of Berlin, on Hadrian's villa.

THE "Association Provinciale des Architectes Français," founded at Bourges in 1889 to serve as a bond of union between the provincial architectural societies, will hold its sixth general meeting at Toulouse, the centre of the "Société des Architectes du Midi de la France," from June 6 to 9. The programme of subjects to be considered includes those of public competitions, architects' charges, establishment of a "Caisse de Secours," regulations for laying-out of streets, rewards to artisans in building work, and above all the question of architectural education in the provinces, and the formation of provincial schools of architecture, as a means of breaking through what is considered to be the too great centralisation of architectural education in Paris. Visits will also be arranged to the architectural monuments of Toulouse, and excursions to Albi and Carcassonne; and on the 9th the meeting will adjourn *en masse* to Lyons to attend the annual Congress of French Architects to be held, as already mentioned in our columns, in that city.

ON the 22nd ultimo were sold by auction a set of portraits, life-size, of Kings George I.-IV. and William IV., by Kneller and Allan Ramsay, and after Sir Thomas Lawrence, Sir Martin A. Shee, and Kneller. The pictures were described as having been removed from the offices of the old South Sea House, Threadneedle-street. They represented past Governors of the company, founded in 1711 by Harley, Earl of Oxford, and Sir John Blunt. The original office, long known as Old South Sea House, fronted Old Broad-street, and had previously been

used for the Excise. Of Cockaine House Cunningham, in his "Handbook of London," says that the site is unknown: in the Parish Clerks' "New Remarks," 1732, mention is made, for St. Peter-le-Poor (Old Broad-street) parish, of "a large house built by Alderman Cockaine, formerly the Excise-office and the South-Sea Company's House;" whilst Aubrey, in his "Lives," says that Eliab, brother of Dr. William Harvey, "bought about 1654 Cockaine House, now the Excise-office." The South Sea House, which Charles Lamb, in the first of his "Essays," likens to Ossian's desolate Balclutha, was the new building in Threadneedle-street, east end, north side, which Northouck characterises as "a magnificent structure." On part of the site of the old house in Old Broad-street was erected, in 1832-4, the existing premises of the City of London Club, after the plans and designs of P. Hardwick, R.A.

ON December 13, 1884, we printed a description of an addition, in the shape of an east wing, that had been made from Mr. Matthew Wyatt's designs, to the Middlesex Hospital, for out-patients and the resident staff. We understand that the Governors propose to erect additional accommodation for the Cancer Wards (women's) side. The hospital was originally established in Windmill-street, Tottenham Court-road, and removed ten years later (1755) to its present quarters, erected by, we believe, James Paine. These were extended in 1775, and again in 1848 with the "Sir John Murray's" Ward, built by T. H. Wyatt, who bequeathed 100*l.* to the hospital. The Cancer Ward, planned by Howard, the philanthropist, is due to the munificence of Samuel Whitbread, M.P., who endowed it with 4,000*l.*, in order that the cancer patients might be tended therein for life.

A BENEFICIAL alteration is about to be made for the parish of St. Peter's, Walworth, one of the most densely-populated districts in South London. The Goldsmiths' Company have agreed, as we learn, to expend 700*l.* upon the laying-out and planting, by the Metropolitan Public Gardens Association, of the graveyard around St. Peter's Church; and in pursuance of an order in Council all human remains will be removed from the crypt underneath the church. St. Peter's was built in 1823-4, at a cost of about 19,000*l.*, after Soane's designs. The west front has an Ionic order, the lower story of the tower is in the Corinthian style, the upper story being composite.

ON the 30th instant will be put up for sale by auction the celebrated Adrian Hope collection, which includes sixty choice works by the old Flemish and Dutch masters, with others by Rubens, Giorgione, and Domenichino, and examples of the modern Belgian school. The earlier "Hope" paintings were seen and commented upon by Sir Joshua Reynolds when he visited the Hague, where the pictures were first gathered together by members of the family. They were removed from Mr. T. Hope's house in Duchess-street, Portland-place, to Hope House, at the south-east corner of Down-street, Piccadilly, which was built for his son by W. Cubitt & Co. in 1848-9, under the late Professor Donaldson's superintendence. The house (now occupied by the Junior Athenæum Club), is said to have cost 30,000*l.*, the two fronts being of Caen stone, with marble panels, the iron railing by André, of Paris, and the interior decorations, carvings, &c., by Dussillon and a staff of French artists. We believe that subsequently most of the pictures and objects of art (many of the latter coming from Sir W. Hamilton's collection) were transferred to Mr. Thomas Hope's seat, Deepdene, near Dorking. That house, built in 1790 for the Duke of Norfolk, was enlarged for him by P. Atkinson, from Hope's own designs.

AT the Architectural Association's Rooms in Great Marlborough-street, on the 24th ult., Mr. Stirling Lee gave a most interesting lecture on "Sculpture in relation to Architecture"; not a lecture in the formal sense so much as a pleasant and enthusiastic talk of a sculptor with architectural students, very practical in every sense, and very instructive. Mr. Lee traced the growth of figure sculpture from the plain moulding through its various stages, and had a large number of photographs and models to illustrate his remarks. He dwelt upon the value of shade perception both to sculptor and architect; showed how, in most old examples of architecture, the leading lines of the building had been kept and considerably assisted and strengthened by the sculpture; with some interesting examples from Pisano's and Giotto's work; and laid stress on the fact, which all architects, both old and young, should lay to heart, that if good architectural sculpture is not to be had, it is far better to leave it out altogether rather than spoil a building by cheap work, which is not only an eyesore in itself, but ruins the building on which it is placed. The well-known example of the Institute of Chartered Accountants was, of course, mentioned as one of the most successful buildings recently erected in which sculpture in relation to the building plays so prominent a part. Mr. Lee very generously offered to open his studio on Saturday afternoon (June 2) to members of the Architectural Association, who might be interested in seeing it, and no doubt many who were unable to be present at the lecture will be glad to avail themselves of this opportunity of seeing the work of a sculptor who has so specially studied his art in relation to that of architecture. The small audience—it scarcely numbered over a dozen—is not, however, a hopeful sign. We could find, it is true, no mention of this paper in the calendar of the official notes of the Architectural Association, and it might be desirable to point out to those responsible for the well-being of the society that men of Mr. Lee's ability and standing can hardly be expected to give up their valuable time for the benefit of the Association if there is not a more encouraging response in the form of a larger attendance of members.

A SPECIAL three days' sale of needlework, of bric-a-brac, and of carved English and Flemish furniture was held last week at the Royal School of Art Needlework, at Exhibition-road, South Kensington. There is much of interest to architects in the work-rooms and sale-rooms of this school, which are open all the year round. Besides some valuable Flemish tapestry, we may draw attention to some Gothic panelling in oak from Belgium. It consists of a dado, 62 ft. in length and three panels high, finished with a moulding; the lower panels are linen-fold, and the upper carved with scroll foliage of a German type; the carving has a good relief, and the whole height is about 6 ft. In the Oak-room is a bedstead from the Archbishop's Palace at Malines, of a somewhat later period. It is a canopied enclosure, the back and one end being of plain panelling, while the foot has an open arcade of four arches; the front opening is enclosed by caryatid angels and grotesque carvings supporting a good frieze and cornice; the bed-plinth is divided up and well panelled. In an adjoining room are some chairs of Louis XVI date with elastic cane backs and seats, the cane being gilded and set in an enamelled wood framework, carrying us back to a time when cane-work was not confined to the commoner sets of furniture. Some modern beaten brass-work, executed from the designs of Mr. Fairfax Wade, should be mentioned. We may state that the school execute architects' designs in needlework, some good copies of old work being shown, as well as some church work executed from the designs of



Messrs. Morris, Wade, and Selwyn Image. By the latter there is an altar-cloth worked with three archangels and two attendants; the figures are in outline of dark brown silk on a white cloth, and are connected together by a broad band of foliage worked in green wool, the style being bold, so as to be effectively seen at a distance. A fine old bible of 1640 (R. Barker, London) is shown, in a case copied from that worked by Queen Elizabeth, and now in the Bodleian Library; the design has conventional roses and scrolls, the back having an upright stem with roses upon it; all these are in gold upon deep-red velvet. We have already referred to the work of the School, and architects will be interested in it as a place where they can have their designs executed under their own supervision, which is welcomed by the authorities.

#### ROYAL INSTITUTE OF BRITISH ARCHITECTS.

AN ordinary meeting of the members of this Institute was held at 9, Conduit-street, on Monday last, Mr. J. Macvicar Anderson (President) in the chair.

Mr. J. Tavenor Perry read a paper entitled "The Influence of the Hanseatic League on the Architecture of Northern Europe."

Mr. Perry said that his paper would not be an account of how one district and alien style affected another, but its object would be rather to show how the living and progressive styles of succeeding periods became transformed by the necessities and peculiarities of an influential and semi-political association of merchants who inherited and carried on the traditions of the earlier German schools at a time when German architecture was, to quote the recent Address by Sir Frederic Leighton, "Stamped with a stateliness and nobility to which the days of the Minnesinger were surely more propitious than those of the rugged burghers who were soon to rise to power and to rule in the art-producing world." In the course of several visits he had paid to the lands about the Baltic Sea, he had been much impressed by the similarity existing between the buildings, however widely they were scattered, and however divided were the provinces by ethnographic or political differences. In other countries more or less homogeneous in their governments and people, such as France or Spain, strong local differences in style always existed; but over the vast area of Northern Europe which stretches from the sand-dunes of the Gulf of Bothnia, there could only be said to have been one style carried on throughout the Middle Ages—a style quite dissimilar to those of the rest of the Continent, and executed with a uniformity of detail, marking a distinct and complete school. There was nothing in the geological conditions of the countries to account for such coincidences; and the similarities, so obvious, were evidently due to other than merely geographical or political accidents. The subject was too large and the countries involved too extensive and scattered for any one person, and certainly for any one architect still engaged in practice, to deal with in anything like an exhaustive way, but he had made an attempt to put together such information as he had been able to acquire, with the idea of sketching the outline of a theory, to be filled in hereafter or corrected by those who may have had, or may obtain, better advantages in further information or personal acquaintance with the buildings. Mr. Perry then gave a brief history of the rise and progress of the League, and afterwards an account of the characteristics of the Baltic style, together with some of the most marked features in its arrangements and details; and, later, he endeavoured to show in what way it affected the architecture of surrounding countries, and how far the influence of the later phases of the style still survives. He pointed out how, in its gradual rise, the centre of authority of the League shifted from the banks of the Rhine to the shores of the Baltic, and the effect of this change on the architecture of the district. The earlier influences of Cologne, first on Hildesheim, and then, through Hildesheim, on Denmark and the Baltic coasts, were manifest in the great apsidal churches of Ribe, Roskilde, and Lund; but when, later, Lübeck became the head of the League, she also became the centre of

architectural influence, and the ecclesiastical buildings of the fourteenth and fifteenth centuries in the north of Germany were much more affected and inspired by the Dom of Lübeck than by the far finer, but less German, Cathedral of Cologne. Wherever the agents of the League settled, they seemed to have indoctrinated the people in the mysteries of brick-making, until, in countries where stone and granite had always been used, the new-fashioned brick eliminated the nobler material. Besides this, there were peculiarities of detail and design, partly arising from these causes, and partly due to mere localisms, which were evident in the buildings throughout the countries controlled by the League. The home of the League and its principal cities were in Wendland, which embraced Pomerania, Mecklenburg, and parts of Lower Saxony, a country of great sandy plains sprinkled over with huge granite boulders brought down by the ice from higher latitudes. Here stone was only to be procured by importation from Sweden or elsewhere at great expense, and the architecture which grew up was almost exclusively of granite and brick. In Stralsund, however, which had closer dealings, perhaps, than any other of the Hanse ports with Sweden and Wisby, stone continued to be used for ornamental purposes in connexion with bricks; and in the beautiful church of St. Nicholas, erected between 1311 and 1330, the capitals, bases, and string-courses were of Swedish limestone. . . . Throughout Sweden and Norway were fine beds of building stone, easily procurable, but in the Hansa town of Bergen the two churches were of brick-work; Upsala Cathedral was mainly brick; and although the earlier work of Linköping, Lund, and Örebro, was executed in stone, the later additions on the western fronts were wholly in red brick. In Livonia, again, where limestone abounds, such old buildings as still remain in the Hansa towns of Reval and Riga were mainly of brick. The case of Wisby and the buildings of Gotland were wholly exceptional. This island, like the neighbouring one of Öland, contained good building stone, of which most of the churches were built during the period when Wisby, having risen into importance after the destruction of Jomsborg, looked to Cologne as the head of the League; and, besides, the capture and destruction of Wisby by the Danes, although it consolidated the power of the League, came too soon to allow the later influence of Lübeck to considerably affect its buildings. After mentioning some examples of this influence on Hull and other places in England, and tracing to it the introduction and development of that brick architecture which culminated in such edifices as Hatfield and Hampton Court; Mr. Perry next referred to those features of architectural treatment which must be regarded as peculiar to the Baltic style, and which, he said, distinguished it, even more perhaps than the material employed, from other contemporary Gothic work. The most important of these, the arrangement of the church plans, seemed to have been overlooked by most writers on the subject, and was not referred to in Fergusson's Handbook, although the two exceptional plans of the Dom and Marien-Kirche at Lübeck were therein published. Yet this plan was essentially different from the methods adopted in France and England. The great differences existing between the origin and development of the plans of the eastern terminations of French and Baltic churches had scarcely been noticed, and no attempt seemed to have been made to account for them; yet a comparison of the plans of the Cathedrals of Lübeck and Cologne would show that their designs could not have been developed from the same starting-point, or have been arrived at by the same methods.\*

Mr. R. Phené Spiers, in proposing a vote of thanks to Mr. Tavenor Perry, said it was nearly thirty years since the writer of the paper, who was the first Pugin Travelling Student, decided in making his tour to see what influence the cathedrals had on the buildings surrounding them. Mr. Perry then took the Cathedral of Durham, and made an elaborate and careful

study of it. He (the speaker) had, on several occasions since, suggested to the Pugin students that they should follow a similar system to that which Mr. Perry originated, but without success. Mr. Perry had apparently still carried the idea in his mind, and, as the result of a survey extending over many years, had produced a most valuable and suggestive paper. In the hope that students would even be inclined to go a little further, to the Baltic provinces, he had brought down some drawings of the old towns there. Dantzig was interesting in this sense—that the church had a somewhat different character to those Mr. Perry had referred to. It was begun by the Knights of the Teutonic Order, to whom reference had been made. The church was of considerable magnitude, being about 350 ft. in length and some 100 ft. wide, with a vaulting of 98 ft., so that its stupendous effect and grandeur would be imagined. The Castle of Marienburg, near Dantzig, was also interesting, as having been the seat of the Knights of the Teutonic Order for 153 years; there were portions of an older Schloss, which existed prior to their settlement. That which would be most interesting to architects was the great hall in which the conclaves were held. The stone tracery introduced into the windows of the building was rather suggestive of Venetian influence, and it was possible, although he could not find it stated in the German guide-books, that Venetian masons were sent over to carry out this work. In Mr. Perry's paper, he had pointed out that the principle of the chevet was of German and not of French origin. Looking at Mr. Perry's diagrams, there seemed to be some reason for that, but, at the same time, although he contended that the French chapels were always arranged on the outside of the choir aisle, the Hanseatic churches had their chapels placed on the outside of the central apse.

Mr. Perry remarked that the one was outside the semi-circle, and the other outside the polygonal figure.

Mr. Phené Spiers, continuing, said that Mr. Perry at first seemed inclined to agree that there could not have been much Hanseatic influence in the case of Westminster Abbey, but he appeared afterwards to fancy there might have been some connexion between the two, the chief reason for that being the influence of the League at the time when the Westminster chevet was being built. There was, however, another reason which might be given for the peculiar arrangement. The first building erected by Henry III. to Edward the Confessor's church, was the Lady Chapel, which was 30 ft. wide, and, as the wall had been found close to the east end of Henry VII. chapel, it showed that it must have been of extraordinary length. When it was determined some twenty years later to build a chevet, in imitation of those being erected in all French cathedrals, it naturally followed that, with the much wider chapels, they would extend west of the apse, and it seemed to him that the western buttress, which was the same as the western buttress in the Dom at Lübeck, was due to the setting-out of the plan, and the resemblance accidental. The last paper read before the Architectural Association was one by Mr. Bolton on practical notes on travelling. The author of that paper gave advice with regard to France, Italy, and Spain, but he seemed to have altogether forgotten Germany. He (the speaker) was always ready to give advice to students who were about to travel, but he seldom asked him for information about Germany. Mr. Perry's paper would be of great service, therefore, in pointing out the very great interest of the North German churches. His last tour there was made three years ago, when he visited, amongst others, the churches at Paderborn and Soest, which had a magnificent effect, and were most valuable studies for the young architect. The cathedral at Münster also would well repay the student, even if he did not extend his journey further.

Mr. Charles Fowler said that many years ago he had the honour of bringing this subject before the Institute, and he was glad to find that it had been so ably followed up by Mr. Perry. With respect to what had been said as to brickwork, he knew of two examples dating back to early in the twelfth century, viz., the Schlosskirche at Quedlinburg, and the church at Jerichau. These were both very large churches, and entirely different in their arrangement to any of those referred to that evening. Unfortunately, both of these churches had been terribly restored; but he had spoken of them as they appeared to show a strong brick influence, anterior to the period referred to by Mr. Perry. He had refreshed his memory last autumn as to some of these churches, but he

\* Address to the Royal Academy students, December, 9, 1893.



found to his regret that in almost every case restorations had taken place, and it was difficult to know how much of the original work remained. Nearly all the churches of North Germany, from the middle of the fourteenth century, were on the plan of three aisles of equal height, which certainly produced a grand effect internally; but here was a vast space, and the details, as regards the doors, arches, and windows, were repeated throughout the church. The great gateways to some of the towns were also very interesting. Mr. Fowler concluded by seconding the vote of thanks.

Mr. W. H. James Weale (South Kensington Museum) said it was only of late years that attention had been given to the influence of the art of one country on another. He had listened to the paper with great interest, having given some attention to the influence of the Hanse on Flemish architecture. One or two points, however, he would demur to, such as the initiation, in the countries in which the Hanse was established of the art of brick-making. He believed that brick was used in Flanders prior to any influence of the Hanse. In that country three influences were at work, the first being that of the Benedictines, as shown in the tower part of the Cathedral at Bruges; secondly, the Cistercian influence, which brought in French architecture; and next, the influence of the school of Tournay. The stonemasons erected many buildings of stone in Flanders, but, at the same time, there was always brick construction going on, and there were remains of brickwork of the end of the twelfth century in some of the village churches. Fine examples of brickwork were to be found at Ghent and Bruges. As to Danne, he did not think the Hanse had any influence on the building of the Hôtel de Ville in that town. The Cathedral of St. Sauveur at Bruges differed much from the other churches there in the setting-out of the five chapels. Its architect was employed by the Hanse to build their Hôtel at Bruges, and had no doubt visited the other Hanse towns, so that he built the five chapels on a different plan to anything else to be found in Flanders, and very much in the plan of the chapels at Lübeck. The arrangement of those chapels had always struck him as being peculiar, but very grand.

Mr. H. W. Brewer said that through the whole of Germany there were two distinct kinds of churches. One was a class built in the dominions and under the influence of the Prince Bishops and other ecclesiastical dignitaries; the other was erected in the Free Towns. Those built by the Prince Bishops required a number of chapels, whereas the churches in the Free Towns were constructed to hold very large congregations served by a few priests. In some of the cities, like Cologne and Bamberg, it could be found that the churches, as a rule, had their clearstories, a certain number of chapels, transepts, and generally more than one apse; whereas in the Free Towns the churches simply consisted of vast halls, with the aisles sometimes carried round the apse. The German arrangement of the apse was very puzzling, and Sir John Leighton, in a paper read at the Royal Academy, found much fault, and to a certain extent justly so, with the apse of the cathedral at Augsburg. Two architects had been at work there. The first planned the arches, and his apse the same width as those in the choir, and as the arches of the choir were wide, it gave a slight cant to the arches, so that they appeared almost to give the effect of a square-ended church. He, however, got an alternate arrangement of square and triangular apses, and that led to his arranging nine chapels in the chancel. The man had certainly an idea in his head, but the architect who succeeded him made the whole design absurd, by putting a large window in the east bay, and leaving the other bays with only little holes up in the vaulting. Mr. Perry had referred to painting on brickwork, and he (the speaker) had come upon some remarkable examples in Germany. The strangest specimen he had ever met with was on the walls of Ingolstadt, a town which retained nearly all its ancient walls, gates, and towers. The machicolations were absolutely painted upon the walls, and the remainder of the space was covered out like stone. He had seen a tower with painted windows and men looking out of them. There was one fact which strongly corroborated the view taken by Mr. Perry as to the use of brickwork in London. When Ralph Jocelyn, the Lord Mayor in 1477, restored the City walls, he found those by St. Margaret and Cripplegate were in a bad condition. Now, although the walls were of

stone, he built his parapets and additions in red brick, as could be seen by some of the old engravings at the Guildhall.

Mr. A. S. Flower wished that Mr. Perry would say a word or two more about the reasons which induced him to attribute English brickwork to German or Hanseatic influence. It would be interesting if he could say that he had, in the course of his reading, come across any definite traces of the influence of the Hanse merchants, in importing bricks, doing the work of brick-making, or in any way influencing the trade. So far, they had only had coincidences.

The President said the paper that evening led one to reflect on the intimate connexion between commerce and architecture. Originally a small association of merchants, this League became ultimately an association of great cities, spreading their influence and exercising political power, not only in their own towns, but also in foreign lands. The connexion between commerce and art was very direct and remarkable. It was illustrated over and over again in the world's history, and nowhere more than in the case of their own country, which spread its influence not only over their own land, but, in these days of colonisation, to the most distant ends of the world. How much, then, did it behoove them to realise the influence their own art might exercise on this land and the countries they colonised. A league consisted of individuals, and it would be well if each individual architect, composing what might be termed the league of architects, would only realise that he should design not merely for his own delectation, or to indulge his own fancies, but that his designs would have an influence for good or evil on his own day and generation, and on succeeding ages also. If architects only realised that, he believed they would be more careful in the designs they sometimes gave birth to.

The vote of thanks was then put, and carried by acclamation.

Mr. Tavenor Perry, in replying, said that Mr. Weale had thrown a new light on St. Sauveur at Bruges. Referring to a painting upon brickwork at Tattersall Castle, in this country, it would be found that in the brick groining they had plastered over the soffit, and had painted the brick joints on the plaster. As to brickwork or bricks coming from abroad, he believed that a great deal of the bricks used at Sandwich were imported from Holland.

The President announced that the next meeting would be held on June 11, when an election of members would take place, and the scrutineers appointed at the annual general meeting would bring up their report, and declare the names of those elected to serve on the Council and Standing Committees, and to act as auditors for the year 1894-5. At that meeting Mr. Bernard Dicksee and Mr. Lovegrove would raise a discussion on the election of Fellows of the Institute. The proceedings then terminated.

## THE ARCHITECTURAL ASSOCIATION.

### THE PRACTICAL SIDE OF TRAVELLING.

THE last ordinary meeting of this Association for the present session was held on the 25th ult., in the meeting-room of the Royal Institute of British Architects, Mr. E. W. Mountford (President) in the chair.

The following new members were elected, viz.:—Messrs. R. C. Neat, P. A. Lamb, L. Sage, and P. R. Nathan.

The first summer visit was announced to take place on Saturday, June 2, to the Houses of Parliament and Westminster Abbey.

The President stated that he had received a letter from the Architectural Association Prize sub-Committee, saying they had unanimously awarded the studentship to Mr. C. C. Brewer. The sub-Committee considered Mr. Brewer's drawings and sketches altogether exceptional merit, so much so that they hoped the whole of them would be hung at a general meeting, for the benefit of the younger students of the Architectural Association who might be competing in future years.

A vote of thanks was passed to Mr. Stirling Lee for his lecture on Sculpture on the preceding evening; and it was stated that he would be pleased to receive any Architectural Association students at the Vale, 306, King's-road, on Saturday, June 2.

### Election for Officers.

The President said that, before calling on the scrutineers to hand in the results of the election, he thought it right to refer to a circular which had been sent to various members of the Association.

The Committee felt,—and he had been asked to express their feeling,—that such circulars were not at all desirable. They wished in no way to curtail the liberty of the members, but it was not right that one section of the Association should endeavour to influence the election of the Committee representing the general body. It was obvious that if that idea were carried out still further, and each class sent round a circular, the whole thing would tend to disorganise the Association, and would lead to a state of affairs which would be most deplorable. He did not suppose for a moment that there was any improper intention in sending out the circular, but it was better not to circulate, if possible, as, amongst other drawbacks, it led outsiders to make unkind remarks about the Association.

The President then read the report of the scrutineers, which stated that 438 voting papers had been sent in, of which 17 were rejected as invalid. The result was as follows:—Unopposed; as President, Mr. E. W. Mountford; hon. treasurer, Mr. H. W. Pratt; hon. librarian, Mr. Stenhold; hon. secretaries, Messrs. F. T. W. Goldsmith and B. W. Fletcher; elected as Vice-Presidents, Mr. A. B. Pite, 273 votes; Mr. F. G. Hooper, 187 votes. As ordinary members of Committee, Mr. W. D. Caroe 376 votes; Mr. J. Begg 306 votes; Mr. E. S. Gale 306 votes; Mr. F. R. Farrow 296 votes; Mr. Paul Waterhouse 291 votes; Mr. E. Woodthorpe 287 votes; Mr. G. H. F. Prynne 274 votes; Mr. T. Moore, 255 votes; Mr. W. H. Seth Smith, 254 votes; and Mr. Owen Fleming 205 votes. The above formed the Committee.

Mr. Earle proposed that the votes given to the whole of the candidates should be announced. This was seconded by Mr. Brodie, but, on being put to the meeting, the voting was so close that the President thought it would be better to leave the matter as it stood. Votes of thanks were then passed to the scrutineers.

On the motion of Mr. E. W. M. Wonnacott, seconded by Mr. S. B. Beale, a cordial vote of thanks was passed to the retiring President, Vice-Presidents, and other officers of the Association, which was duly acknowledged by the President.

Mr. A. T. Bolton then read a paper on "The Practical Side of Travelling," from which we extract the following:—

In deciding on any proposed tour a certain amount of previous study is generally advisable, and is to be obtained either from those who have been there or from books.

As to books it is very annoying on your return to find that you have failed to see some well-known example in some place you have visited, and of which you have seen drawings in some book. Many illustrations of old work are sensational in character, and sometimes positively misleading, but have a value if you have seen the thing itself. The best plan of study to adopt is to arrange your notes under the names of towns, placed in alphabetical order, putting down the work of all styles, the name of the artist, and the description of drawings. These notes are best on foolscap sheets of paper which can be pinned together and taken with you. You will soon be able to judge what is worth an effort to see, and what is not, according to the credit you assign to each artist after seeing a few examples.

The one indispensable book is a guide-book of the latest edition, and the best repute, however dear, as information is money in travelling, and a mistake in making an excursion or choosing an hotel would easily cost double the price of any guide-book, to say nothing of the saving of tips to local tout, rendered unnecessary by good maps. For Italy Baedeker is best, for Spain Murray, and for France Hachette, and I specially recommend the Departmental Guides of the latter, which are very useful indexes of all that there is of interest, in each town or village of the Department.

Calling on people is not always successful in the way of obtaining positive information on points of detail; "Oh, you know, you just take a bag, and go right south, and come back by degrees," being one style of friendly advice. As to going direct south even on a long tour, there is much to be said either way. One reason, against, is that it is not always convenient to start so early in the year, and another is that you are translated into a new style of work which has no direct bearing on your own; whereas if you go by degrees through France you pass through districts full of work which resembles, but is better than, what you are doing at home, and naturally you can get to work on it at once. Moreover, when you do arrive south, you will have acquired some skill in drawing, and have learnt something of the later results, and meaning, of the earlier work



which is met with further south. It is, of course, a question of season and climate which you must look into. Egypt is visited in the winter, Greece in the early spring, Rome is left after Easter, Florence at the end of July, and so on. Spain can be visited either in autumn or spring, and a winter in Seville may be most agreeable.

As to the countries to visit, Belgium and Germany are good for brickwork and small buildings allied to our own; France should make you logical, Spain critical, and Italy enthusiastic.

Programme is the great feature of French work, the logical following out of certain ideas, excluding others considered as non-essentials. Spanish work invites criticism by the dash with which the work appears to have been done, for form, outline, and programme are less considered, and things are often either masterpieces or absurdities. In Italy you will be roused to enthusiasm, because there you will see good work of all styles, and the early origins of most subsequent developments, as well as the acknowledged masterpieces of all the three arts.

Leaving, however, these generalities of where to go, let us consider what we have to take with us.

The subject of to-night, the "Practical Side of Travelling" can only be useful if treated with a detail which has a large element of the ridiculous, but I am not afraid that you will fail to perceive that side of the question. However, to begin with the question of luggage—I never knew any one who took too little, but some who would have been glad to send half their home again. The easy manner in which the would-be traveller dismisses the subject previous to departure is in amusing contrast to his sentiments a few hours past the Channel. I had once to use all my influence to prevent a friend coming out to me in Italy, plus a portmanteau, but he candidly owned, on arrival, that no sooner had he arrived at Calais than he was thankful to have only a Gladstone.

One reason for this luggage question, which it would take too long to examine in detail, is that the heavy luggage is registered, and hence there are nothing like the numbers of porters at the stations that we have. In making a change, or getting into a train, you will probably have to rely upon yourself, and it is of the first importance to be able to carry your goods, yourself, at need. This condition is the determining one in all points of luggage. Registration is fallacious, because, first, it involves arriving early at the station, the process ceasing ten minutes before the train goes; consequently there is generally a great crowd at the luggage barrier, and it is most annoying to have to be waiting about for your turn, when you want to be securing your place in the train. Secondly, it involves waiting at the other end, as the process of delivering the luggage does not commence till the train is gone, and is often very slow, as in Paris, where, I am told, three-quarters of an hour is a common time to wait. Hence, if you had nothing registered you would have been off, and arrived in your hotel in the same space of time. Finally, you can only register as far as the ticket goes: luggage above a certain weight has to be paid for, and in some countries no allowance is made at all.

Assuming, then, that nothing larger than a Gladstone is admissible, the next question is number of inches. Here the Indian mail gives a clue. The mail through Italy has a limit of 20 in. by 10 in. by 12 in., and I have had a 24 in. taken to the van. The same 24 in., I may add, I was only too glad to get rid of later on for a 20 in., which I consider the largest size necessary even for a year.

So much for No. 1; next, as we are architects, comes the question what size board shall we take.

Finally, I decided on a half imperial, which is really an excellent size. I then had a case made of waterproof canvas bound with leather, opening the long side, with two straps and two buttons for the flap. This case is best with a flat, light, iron bar along the top to attach the handle to, as, otherwise, you will find that the flap will pull out of shape.

Have this case wide enough to take the half imperial board (in a 25. 6d. portfolio with T-square, two sets squares, and 12 in. scale), a stool that will fold up flat, a roll of lining-paper, and an easel.

1st. The board. This you will find best without ledges, but framed with steel in the thickness, as made by Stanley for abroad.

2nd. The portfolio. This is useful to carry about in the street, as it excites less attention, and also to hold the drawings as you complete them, and the paper you still have to use.

3rd. The T-square; for abroad, the extra cost of mahogany is well worth while. The great

problem is the length, and after trying both ways, I advise you to shorten it, so that its total length is that of the board. It is, of course, sometimes a nuisance that it will not reach the edge of the paper, but it is still worse to carry it about projecting in a dangerous manner outside the portfolio. It is also a troublesome thing because of the thickness of the short arm, and I think the best thing to do is to buy one large or two smaller sketching-blocks, which will make up the level over the rest of the board's surface.

4th. The drawing-paper.—Take, say, six sheets imperial (cut in half) of hot-pressed and the same of 90 lb. cartridge, with some cut up tracing-paper and a roll of lining-paper; this latter should be the best, for the common tears easily and the other is only rod, a roll.

5th. The easel.—This is a matter of opinion, but personally I find it very useful. The 3s. 6d. sold at the stores, which folds in a very ingenious way, is a good one to take, and you might have it reconstructed to fold into three, as then you could stand to it at need.

That completes our second package, and is of course only necessary if you are going away for three or four months. If for less time, the third that I am about to describe will be sufficient. This is a bag or case of canvas, in two thicknesses, and water-proof, made by Pontifex & Wood (next to Victoria Station) for 18s. 6d. It has two divisions, one of which will take a quarter imperial board and a portfolio, as before described, while the other will contain your things for a stay of one or two nights. It has, as before, two straps with a handle and buttoned flap; and also loops in case you prefer to carry it as a knapsack. It should contain—1st. A water-colour case, holding a short box of twelve paints, a small water-bottle, and a pocket for tubes of colour; 2nd. A 33-ft. tape, and a small ball of twine with a lead plummet for measuring greater heights; 3rd. A short spirit-level, most useful in getting certain heights, as of bases, &c.; 4th. A pair of callipers of wood, opening to 2 ft., useful to take the diameter of shafts and other things otherwise very troublesome to measure; 5th. A pocket-case of instruments; 6th. A box of twelve pencils, B.S. Cohen F being the best for all-round purposes. So much for the architecture. Then a hand-size hair-brush, short comb, razors, strop, soap in case, short clothes-brush, small box of matches, and flannel night-gown. You will also find that you can get two white shirts, collars, and a pair of socks in the other division on occasion.

Now the reason why you will want a quarter imperial board as well as a half is that the half is mostly for use at the hotel for drawing out what you have measured, and, secondly, that there are many short excursions, of one to two nights, to be made from a centre point where you would leave your other two packages. Consequently, I consider this No. 3 as indispensable in any trip, short or long.

Now for the fourth package: This is a rug, coat, umbrella, and two measuring rods in a case, made up into a roll with rug straps.

The author then went into various suggestions as to clothes to be taken, &c., concluding with the recommendation:—In luggage the thing to aim at is to have only the absolutely necessary, and what occupies space are generally things which, if we exercised a stricter supervision, we should leave behind. After a time you will know exactly what you want, and will be able to get ready for a journey at a few hours' notice, and yet go away without leaving the indispensable behind.

After luggage, the question of money is of the first importance. It may govern your route to an extent that will surprise you, and your stay at any place may be either cut short or made unduly long by the difficulties of obtaining supplies. Having tried several plans, I consider, on the whole, that Cook's or Gaze's 5l. or 10l. forms are better than letters of credit on a private bank, simply because their list of agents is more complete, and contains the places you most want to visit, whereas the agents of the private banks are mostly at modern centres of commerce, which are not what you travel to see.

At your bank you will be told, probably with a patronising smile at your ignorance, that their credit-notes can be changed anywhere, a pious delusion which one wishes they might have to experience for themselves. Not only will you experience a most distrustful reception in tendering such paper at other than the accredited agent, but the branch office even of a credit society, many of whose offices are given in your letter of indication, will decline to pay unless the name of the town where their particular office is situated is given in the list. This sounds

incredible, but has happened to me more than once. Consequently, study your letter of indication, and note the towns having agents, which you will pass, and arrange to take in your supplies at intervals.

Moreover, in France, and still more in Spain, out of the larger towns, and sometimes even there, the banks are very shy, and raise great difficulties if your papers are not exactly correct. Consequently, it is a very good plan to go to the bank soon after arriving, so as to secure that they will be able to command your money; and if there should be any difficulty you will have time to write to a head office or to London in order to overcome it.

Remember that you will be absolutely helpless if you have no money abroad; the smiling countenance of your *maitre d'hôtel* will become black as night, and everywhere you will find yourself suspected. Happy indeed you will be if you find some countryman who will risk a loan to carry you to some other town. And so, if you meet any other Englishman in such a plight, endeavour to assist him, as you hope to be assisted some other day.

If you decide on private-bank letters of credit, observe whether they are payable at sight or not, because I have had some at seven days' notice, which made a local office propose that I should wait twelve days before I received the money, being the time to write to Paris, seven days' delay, and time to write back. A very cheerful prospect if you should be in an uninteresting place!

Remember that you will probably stay longest in small places, where English notes are almost unknown, and the plan of carrying five-pound notes, which may answer in Italy in such towns as Pisa, Genoa, &c., will be disastrous elsewhere. A good hint I can give you is to carry a few sovereigns in a watch purse as a reserve, as, at a sacrifice, you will, I think, be able to change them anywhere.

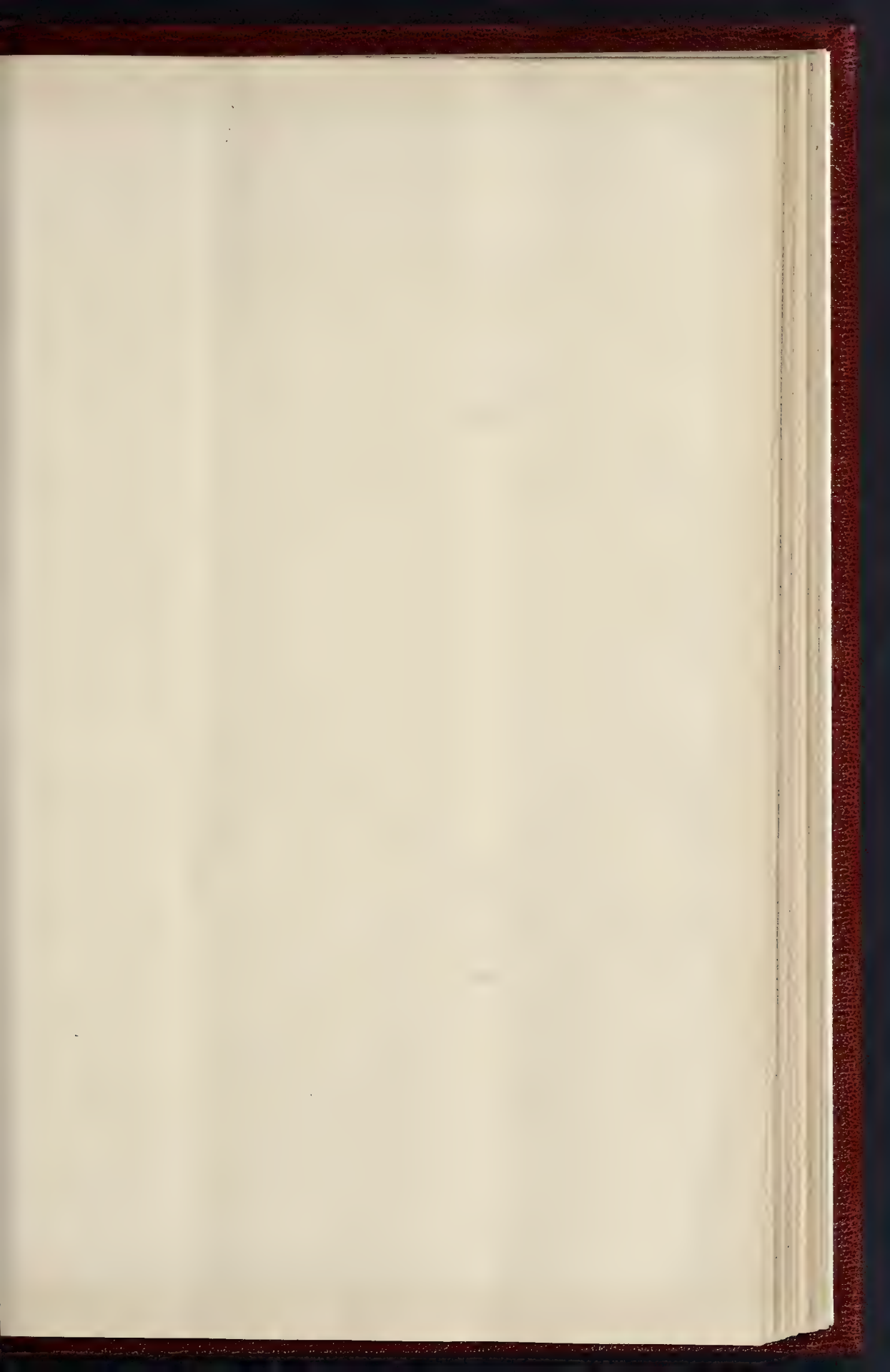
Well, then, having your letters of credit all right, and having found the agency, you are in presence of a difficulty, and that is to obtain the full value of your money. Your paper states that you are to be paid in the local currency to the full value without deduction. Moreover, as you have paid in gold, and the notes are payable in gold at London, there is a profit to be made on the exchange, and you are entitled to the market quotation of the day. Consequently, in France, you ought to receive 25 francs to the pound, plus a premium of 3d. or 4d., according to the market, but which generally amounts to 2s. 6d. on 10l. Now, as the agents can always wait a rise, there need be no scruple on your part in exacting the full value of the day on the plea that they are entitled to something, as you may be certain they will not lose; in fact, I doubt if you will ever get your due. I can, I regret to say, only recall one agency where I have received the full, without asking, even in the most reputable houses, though I can remember many battles on the subject. In fact, I confess I have got tired of fighting, and have now and again submitted to the loss, and even to an absurd deduction for receipt stamps.

But as many of you are men-of-war, you will do a good service to the weaker brethren by insisting on your rights, and may also flatter yourselves that you are asserting the superiority of English currency.

Of course, in Italy, Spain, and countries with bad finances, you will get very much more than 25 francs to the 1l. As I said before, it depends on the market.

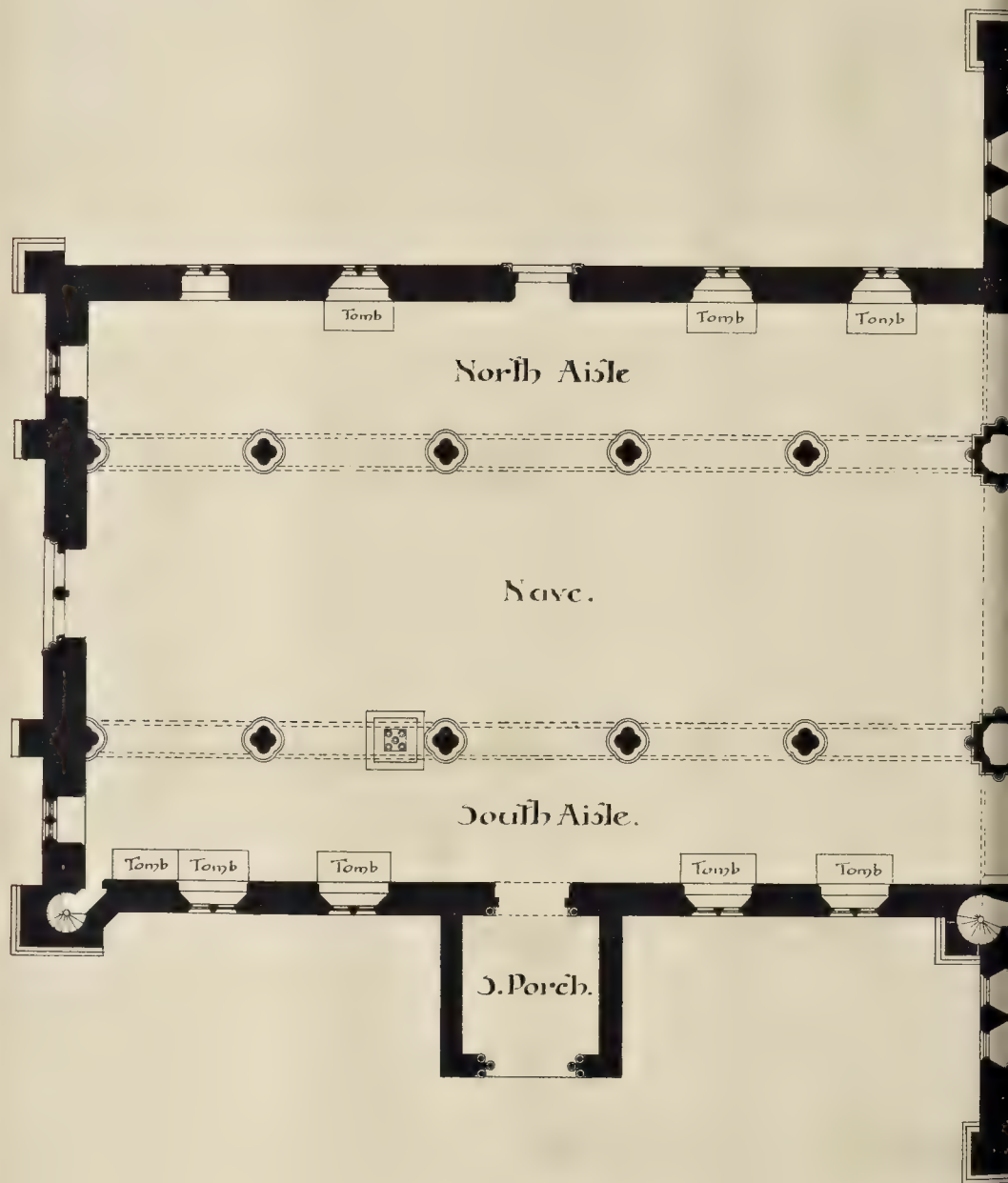
Now, before you start, change at Charing-cross, say, 1l., so as to be able, during the journey, to pay goods, porters, &c., in local value, as they will only accept English silver at a loss; and do not, by the way, take English 25d. stamps with you to send home your letters with, as sometimes happens. In Italy and Spain at present there is practically no gold in circulation, but as the paper notes have a forced currency that will not matter. You must take your chance as to these notes, since you can hardly hope to know good from bad without much practice.

With regard to the amount you must take, the expense of travelling is no doubt always increasing, and in estimating regard must be paid to the length of your tour and the plan you have in view. Sightseeing-travel is the expensive method, and the further East you go the more it is so. France is dearer than Italy, which is the cheapest country I have been in. A short tour is also much more expensive relatively, because the initial price of the ticket out raises the average daily price. You ought especially on a first tour to keep exact accounts and to average your expenditure





# Cathedral of St. Canice, Kilkenny.



Scale of Feet

10 5 0 10 20 30 40 50

147

☐ Modern.

Note. The Roof, with the exception of the Tower-groining, is Open Timber, and was placed there by Sir Thos N. Deane who carried out the Restoration.



Ancient Irish Round Tower.

J. C. Herriot.  
del.





from time to time, because you thus learn what constitutes the chief expense in travelling, and how you can best reduce the average. It is very difficult to compare the relative expenditure of students, because everything depends on the style. You can spend any sum, as some Americans, who get through extraordinary amounts for what they do, and see.

Long stays have an important influence on the average, because such items as hotel tips, porters, buses, sacristans, &c., which bring up the average enormously, when moving about rapidly, become relatively unimportant, and of course you can make better terms at the hotel.

Well, subject to these considerations, here are some figures of probable cost: nine months, extending as far as Athens, 150*l.*; six months, France and Italy, 100*l.*-110*l.*; three months, 70*l.*-75*l.*; two months, 40*l.*-45*l.*; a month, 25*l.*-30*l.*; three weeks, 20*l.*-25*l.*, &c. All these assuming you go some distance away from home.

These figures involve comfortable travelling, second class on through journeys, good and fair hotels, photos and occasional excursions, a drive now and again, newspapers, cafés, &c., but mean that you must know something of the language for the longer tours, and that you must make some stays of three weeks to a month in smaller places, where you can live for 5*s.* a day. Of course, you will be told of record cheap tours, but remember this, you go to work, and work on bad food in badly-trained hotels may mean fever, which is decidedly not economical. I have read accounts of tours where from the remarks made as to weather, people, &c., I have been certain that the writer was suffering from over-cheap travelling. Again it is a mistake to sacrifice your pleasure to unreasonable economy—I mean by omitting an occasional excursion or other semi-amusement on the score of expenditure, because you will find, in your subsequent recollection, such outings form the most pleasant features of the trip. But if you do make such excursions, see that you have the means to do the thing properly. One sometimes sees people abroad do such things in a shabby way, instead of imitating them altogether.

Start your tour with extreme care in your accounts and expenses, as, until you have gained experience, you will waste a great deal of money, and will thus load your average unduly, and it will take much economy to counterbalance it.

A good plan is to make up your accounts on leaving a place, including the ticket to the next place, and the hotel bill, tips, &c., just paid. Look up your balance in the train, and note the amount and hour; then, by deducting from the similar statement on the last departure, you can reckon the number of days and the amount spent, which will give you your average.

Mr. Anstey, in *Punch*, under the title of Travelling Companions, has given a good guide to this subject to those who can see the moral. I have only to add that, in my opinion, Scott's advice never to go with laymen, if you want to work, is sound, for, as he says, when they have finished a place you want to begin.

I think, too, that some similarity of age is divisible as well as previous acquaintance, because we all go through certain stages of beliefs, and you will, in the abundance of your time for talking, infallibly discuss, not so much what you are seeing, as general theories of art, and to have to refute your cast-off enthusiasms in the person of a younger companion may be salutary, but is somewhat wearing.

Bear in mind what the Master of Ballantrae did to Captain Bourke when setting out on their memorable journey, "Either let us agree to bear all things at each other's hands, or else let us part once." As to travelling alone, no doubt it secures unanimity, but I question if it is not better to bear all things rather than to be too much alone. The great advantage from the point of view of an artist, that concentration of mind is essential to the receipt of impressions, then sight-seeing; and, in working, you have the advantage of being free to undertake things that require time, knowing that you can go, or stay, as you please. France, from the generally genial character of the people, and Italy, on account of the greater number of tourists to be met with, are the best countries to travel alone in, but do not do so in Spain, on account of the long, uninteresting journeys that have to be made from town to town, and the not very sociable character of the people, for a really good knowledge of Spanish is required by those who would mix with them. Travelling with another is a drawback to learning the language, without question, and, to some extent, it prevents your seeing so much of

the country and people; but, on the other hand, if you have a friend to go with, excursions on foot, or otherwise, which you would not make by yourself, are more feasible, and this especially is the case in those which are made for the sake of the scenery, when absence of work to do might make the solitude too much felt.

It is hazardous to rely on finding someone abroad, as you will generally find the parties already made up, and fellow students are not often met with except in certain of the larger centres. It is an interesting chance if you should be able to travel with a foreigner, especially of your own age, and leads to a rapid progress in French, which is probably what he will speak.

[The author's remarks as to hotels and living abroad we must omit, as they have no special reference to architectural travel, and we cannot afford space for them here; and must proceed to the portion of the paper which has special bearing on the work of the architectural tourist.]

Concierges and sacristans should not be ignored, and according to the country should be their treatment. In France they are very powerful and often troublesome; in Italy and Spain remember that attempts to postpone your visit to their customary "to-morrow," may be met by saying that you are leaving to-morrow, or to-day, as the case may be, when the loss of the prospective tip may be found to be effectual in removing difficulties. In Italy the direct negative is generally to be met by persistence, as it is often due to the desire to avoid trouble, while a courteous and hesitating negative is likely to be final, as it is generally a polite preface to a refusal. There is always something of the actor about the Italian, as you remember that the Pope, when being stormed at by Napoleon the Great, was heard to mutter "Comedian," and a desire to avoid giving offence is often an explanation of the small comedies which they may put upon you. Once in a museum, I was going round with two Italian students and the assistant curator, and, being desirous to examine an object in a case, asked to have it opened. The assistant was most polite, he thought it was not possible, but would go and inquire of the chief. On his return, one of the students asked, as I was not supposed to know Italian, "Why did you go? Would the case have been opened?" to which the assistant frankly replied, "Oh no, but he is a foreigner?"

It is a good plan not to alarm a sacristan or concierge by going with a big board and apparatus, as if you were going to be a long time at work, but rather to begin quietly at first until they have got used to you. The thing is simple enough—no average man wants to do more work than he need, or to be put to much trouble, and the aim of the average sacristan is to run through as many visitors, and to receive as many tips as possible during his working hours, and hence popular show-places are the worst to work in, the artists, and especially the architect, being a troublesome intruder.

I think you will do well to ascertain the hours of the attendants and to conform to them as much as possible; and when going round in a party in the regular official circuit of a show building, you should, I think, in politeness, keep with the party, and on its completion ask for permission to make further study. In this way you may obtain, as a favour, what would only be obtained, by force, with much loss of time and temper.

Introductions to architects and others abroad are very pretty things, and sometimes interesting information is obtained from the people called upon, but remember, firstly, you may have no end of trouble in finding the addresses in a strange place; secondly, in calling the best hours of the day will have to be employed, and, thirdly, the interviews themselves may take up a disproportionate amount of time. They should not be used by those who are not at home in the language of the country, and it is no easy matter to converse on all the subjects that will be raised, for it is extraordinary how other topics will creep in, especially in the south, and to listen to their views on English policy will be calculated to reduce you to despair.

The Royal Institute of British Architects travelling card, the Academy bone, and, lastly, the Architectural Association membership ticket, will be found of service as credentials when applying for leave to draw and as proofs of your profession; the Royal Institute of British Architects' card, however, is not well got up; it compares most unfavourably, for impressiveness, with the 3*s.* 6*d.* Government passport which anyone can get. Moreover, the face should be in the language of the country, and not the back, as suspicion is

caused by the request to read the back, and the presence of other languages there also is not favourably regarded. An adapted copy of the Government passport, and one for each country, would be the best thing to give students. The letter given to prize students is, however, favourably received, as though it is only in English, it is big, and looks official. With it you are taken for a student sent by the Government, for the English private enterprise is not understood in countries where the State does most things.

*Permessi* are a modern invention, a plague of officialism on the field of art, and an ill-considered method of compensating, by State action, for the personal care of the owners, now dispossessed, of their churches. The most justifiable and useful *permesso* is the free pass at Pompeii, given at the Naples Museum to all who are students, and which frees you from guides and the entrance fees, rightly enforced on tourists. Next comes the one to be obtained at Florence, which also gives you the right of a free entry to certain museums and old buildings, but which, like many others, does not confer that freedom of action as to measuring, and architects' work which can best be obtained, as a rule, where the priests and monks still are in possession.

At Rome there are no less than three authorities, first the Royal Government, in the Via Ripetta, to obtain a *permesso* from whom a letter from your Consul is necessary, stating that you are an artist, the Royal Institute of British Architects' card not being considered sufficient; secondly, the municipal authority, who have control of the Capitol Museum, containing some fragments of architectural detail; and, lastly, the Papal authority, for the Vatican Palace and Museum, who must be applied to a few days in advance, and whose form does not include leave to measure. The Vatican is the most expensive building in the world, I fancy, to see over, as at each door a guardian expects something. Go, therefore, provided with plenty of copper. It is also of little use to apply to see parts, of interest to an architect, which are not shown to the public, unless you can command influence with the authorities.

In other places, as a rule, do not apply at all for permission, as it wastes so much time. I made five to seven fruitless calls on an architect—I believe connected with our Institute—and eventually failed to obtain permission to examine, from a scaffold, some work in which I was specially interested. In churches and convents observance of the hours of openings and shutting, and taking care not to be in the way of services, will generally suffice to prevent your being interfered with, and will, where there are no officials in charge, as a rule, suffice, as the priests and monks are generally well disposed to artists, and they will often lend assistance in a way that no official would dream of doing. The worst places are show churches in big centres, for the sacristan's whole ambition is to pass through as many persons, representing tips, as possible, and an artist who hangs about, and pays little, is regarded as a nuisance. In Rome you may have to resent their action, and the best answer as to what you are doing is to say, "Is not the church open free to all?"

As to working in churches, you need not be afraid to work if a service is going on, provided you are not in the way, or in too conspicuous a position, and provided also that during Mass, or Benediction, you pay some attention to the bells so as to cease from working at moments when reverence is required. If, however, it is a feast day, or the church is a specially fervent one, this will not apply, and you will, of course, stop at once on being asked to do so, which will create a good impression and facilitate your work another day. Continental ideas of the use of a church are, as you will soon find out, different from our own; there is more of the public place, museum, and temple, than of the meeting-place, to be occupied only for so many hours a day or week; very likely you will prefer your own ideas, but need not any the less observe these while there.

I cannot see that difference of opinions can be justifiably translated into outward conduct in foreign churches, especially at service time, and nothing more is expected of anyone than an inoffensive neutrality of a titlode, especially necessary when the chief places are taken by our ardent sightseers, intent on putting through a function.

If a cantankerous sacristan should refuse permission to draw and refer you to authorities it is not always well to hunt them up, because of the loss of time, difficulty of finding them, of making yourself understood, and of working in face of opposition when leave has been obtained.

Continued on page 427.



## Illustrations.

## KILKENNY CATHEDRAL.\*

**T**HE Cathedral Church of St. Canice, Kilkenny, is one of the most interesting of the buildings of its kind in Ireland, and has suffered less from restoration than most of the other Irish Cathedrals of its size and importance. The present city of Kilkenny consists chiefly of one long winding street, with many of the old houses still left. At one end of this street stands the Castle, at the other (or north) end is the Cathedral of St. Canice. Parallel with the main street runs the river Nore, and both the Castle and the Cathedral are well situated on high ground above its banks. The connecting street is also partly on high ground, but northward it is considerably below the level of the churchyard, which is approached by a very steep flight of steps at the south-east corner, the lofty round tower making a picturesque feature in the view obtained from the bottom. On ascending the steps and arriving at the churchyard door the view of the south and east sides of the Cathedral are here seen, with the strongly marked vertical lines of the round tower, contrasting with the equally strong horizontal lines of the main building. This view is the one chosen in the plate—it is undoubtedly the most picturesque and interesting view, and is rarely, if at all, the point from which photographs are taken on account of the difficulty of getting to a sufficient distance from the buildings.

The present Cathedral appears to have been founded by Hugh de Mapolton, Bishop of Ossory, 1251-1256. There had been, however, an earlier building on the site, evidences of which were found on either side of the present choir, and from the position of these more ancient walls, the building must have been of considerable size. Two fires are recorded in the annals of the Four Masters, one in 1114, when the church then existing was burnt by the Irish chieftains, and before that in 1085, "Ceall Cainnigh was for the most part burned." The round tower at present existing carries us back again in all probability to the eighth or ninth century, and the skeletons and burials found both underneath the foundations of the tower and within its area, show that this spot had been a place of sepulchre at a still earlier period. The See of Ossory was indeed founded early in the fifth century, but at Saighir, "by Chiarain, son of Lughaidh, of the family of the chieftains of Osraighe," but it was at a later period (1052) removed to Aghaboe, and it is not until 1251, as before stated, that the foundation of the Cathedral as it now exists seems to have taken place, although the See might have been removed to Kilkenny at an earlier date. The plan, as will be seen by the large ground-plan given to-day, is a very symmetrical one. The nave is of five bays, with aisles and a boldly projecting south porch. The transepts are aisleless but have eastern chapels, that on the north retaining its original form, while that on the south has been considerably lengthened at a later date. The structural choir east of the four great piers of the central tower was of considerable length, and had aisles on either side for rather more than half its extent. A porch has been very recently added in the angle of the choir and south aisle, but this is omitted in the view, although shown on the plan.

The general character of the exterior is one of severe simplicity. The nave has a clearstory of large quatrefoils—one in each bay—with two light windows in the aisles and a triplet above a double doorway at the west end. The triplet is flanked by octagonal turrets with stone pyramidal tops, and there are smaller turrets at the angles of the aisles, that on the south containing a staircase. The western triplet is peculiar, the sill level of the centre light being kept higher than those of the side-lights. In this space a panel containing three cusped circles has been introduced, which is curiously treated inside, and forms one of the most interesting features of the interior. (See sketch.)

The western doorway is a very beautiful piece of "Early English" work. Two doorways, with a quatrefoiled circle above, are enclosed by a richly moulded arch, with carved foliage caps. The circle itself contained sculpture—possibly the



Virgin and Child—and on either side are smaller circles, with angels kneeling in the act of adoration. In the gable over the triplets is a circular window, the inner order cusped.

The large windows of the clearstory are single quatrefoils, of two orders of chamfers, with a continuous hood-mould. The aisle-windows are of two-lights, with a quatrefoil above, in "plate" tracery, the whole enclosed by a hood-mould. At the third or middle bay of the nave on the south side is a fine porch, gabled, of nearly equal height with the aisles. The outer archway has some delicate mouldings and carved caps of similar style to those of the west door, and in the gable is a quatrefoiled circle. The nave has the embattled parapet stepped in the usual Irish manner, but the present parapet of the aisle is a modern addition; doubtless it was so originally, but the aisle in the south-east view, given in Messrs. Graves & Prim's book on the Cathedral, shows a simple eaves-gutter, without a parapet. The old parapets project slightly, and are carried on a corbel-table of simple design. The transepts, north and south, are almost identical in design. Their dimensions are about 40 ft. in length and 28 ft. in width. At each end is a pair of lancets, with a cusped circle above. On the west side is a smaller pair of lancets. The east wall has no windows, but in each case an arch leads into the eastern chapels. The south transept has a staircase in its western wall enclosed in a square turret with a saddle-back roof forming a picturesque feature on the exterior. This staircase leads by a passage in the thickness of the wall to what is now the ringing chamber of the tower. The tower, which at present is only one story in height (its parapet just clearing the roofs that abut against it), was undoubtedly of two stories originally. Like many central towers in England, it fell, and did a large amount of damage to the choir. This was in 1332. It is to be observed, however, that the parapet stands on a string-course, and does not project like the other parapets on a corbel-table, and this in itself would seem to prove that the present finish of the tower was only intended to be temporary. In the view of the Cathedral before referred to in Messrs. Graves & Prim's book, a low conical slate roof is shown on the tower. This has been removed, and a low belfry chamber has been constructed in such a way that it is hidden, in all near views of the tower, from view. There is a stair-turret at its south-west angle, and four stone shoots throw off the water on to the roofs of the nave, choir, and transepts. The other roofs have rain-water pipe heads at the corbel-table level with down pipes held to the wall at intervals by stone bands.

The Lady Chapel, which was built eastward of the south transept, on the site of a chapel similar in dimension to that on the north (known as the "Parish Church"), is an important feature in the south-east view of the church. It is, of course, later in date than the transept to which it

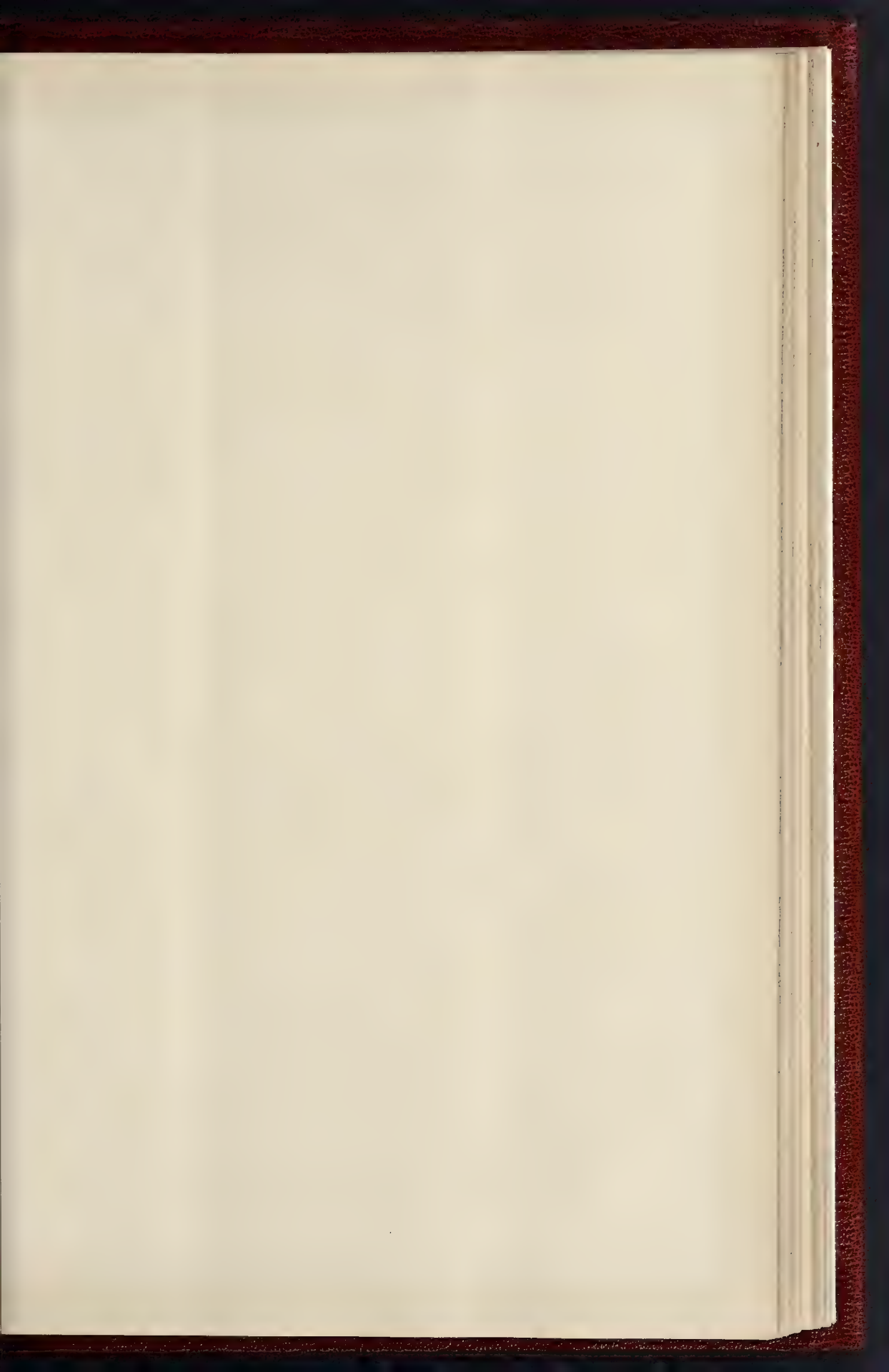
is attached, but the simplicity of its windows on the south, and the "plate" tracery of the fine group of windows at the east end, are of comparatively early date. The windows on the south side are composed of three groups of triplets, a simple chamfered jamb with a plain roll over as a hood-mould. This section is common to most of the windows both of this chapel, and of the choir and its aisles, and gives evidence of the amount of effect to be derived from the use of the simplest mouldings. The east wall has a group of three windows, each of two lights with a quatrefoil in "plate" tracery in the head. The hood-mould in this instance is separate for each window. At the time of Messrs. Graves and Prim's book (1857), the central window on the south side was blocked up, and the mullions and hood-moulds of the east window were much dilapidated, so that in these particulars the features are restorations. On the south wall, about midway between the lancet and the eaves course, is a small head projecting. Its use, however, does not seem clear. A buttress of the same type as at the angles of the transepts and choir, is placed at the south-east angle of the Lady Chapel, and provides a strong support to the walls of the building, which are otherwise so much cut up by the windows.

The Lady Chapel is about 11 ft. shorter than the choir aisle, and one of the lancets in the south wall of this aisle still shows. The second shows inside, and the original scheme of lighting this aisle can be completed by reference to the corresponding north aisle, which still retains its windows. The aisleless portion of the Presbytery projects 30 ft. beyond the ends of the aisles, and is lighted on either side by a fine triplet of tall round-headed lancets. A triplet of pointed lancets, with a cusped circle in the head, lights the east end. These windows were formerly filled with coloured glass, and in the course of excavations made in 1846, fragments of this glass were found, together with the traces of the fire into which, on its destruction, most of the glass and lead had been thrown. A few of these fragments are given in Messrs. Graves & Prim's book, and were pronounced by Mr. Winston to be of fourteenth-century date. The glass was put in by Richard Ledred, Bishop of Ossory, 1318.

With the exception of the difference in planning east of the crossing, and the absence of a projecting porch to the nave, the north side of the church may be said to be a counterpart of the south. There is a doorway in the nave wall opposite the south porch and another in the north wall of the north transept.

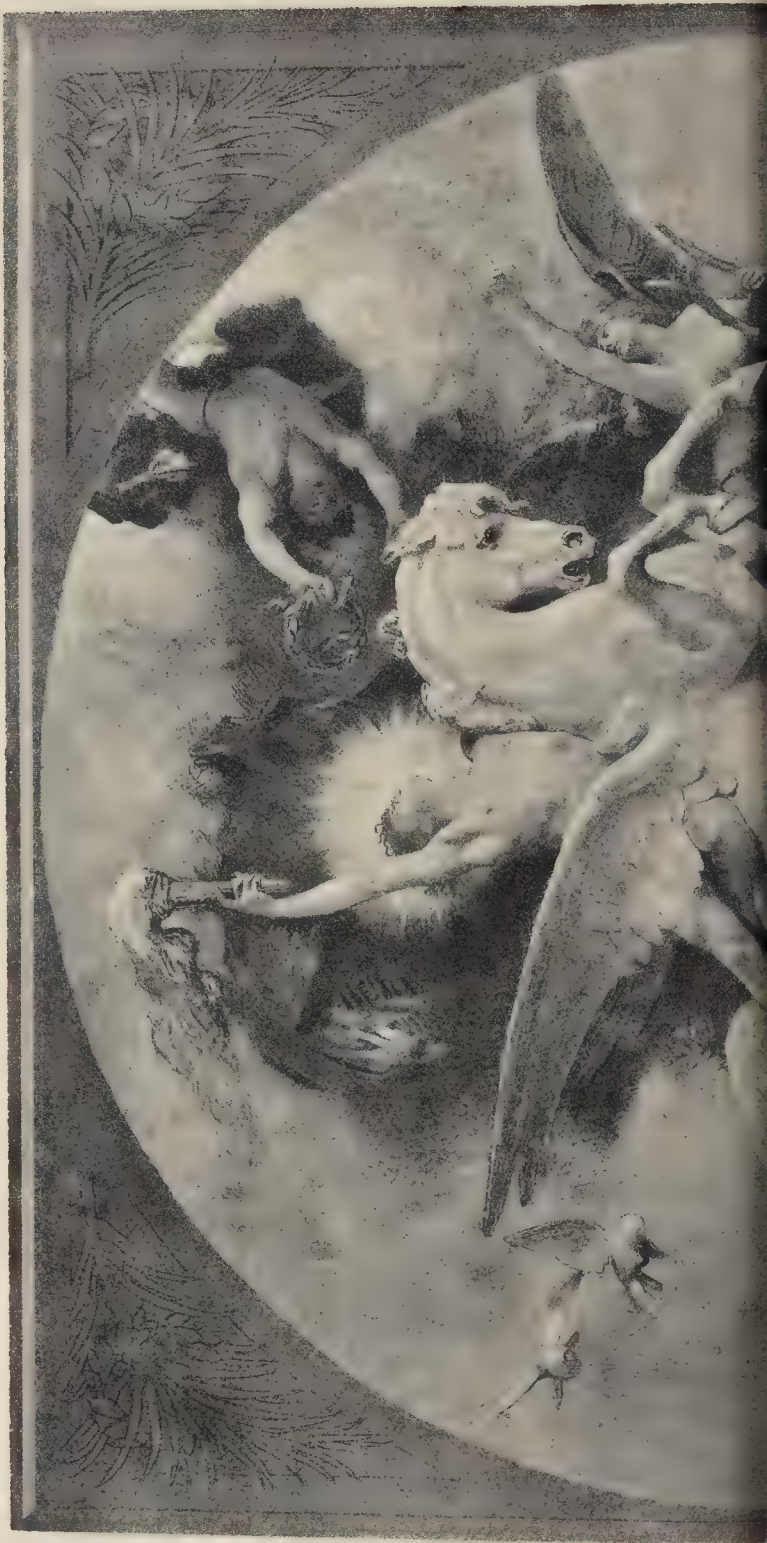
The interior of the church is most impressive. The main lines of the architecture are simple within as without. The quatrefoil—a much-repeated feature throughout the building—occurs again in the nave piers, which are somewhat short in the shaft, with bold mouldings to cap and base, and carry moulded arches of two orders. The quatrefoil windows of the clearstory

\* The series of the "Ancient Cathedrals of Ireland," which was begun in our issue of April 7 last, is concluded in this number. The series of the "Abbeys of Great Britain" will be resumed next month with illustrations of (No. II.) "Rievaulx." (No. I.) "Westminster" was given in our New Year's number, January 6, 1894. ("England and Wales," "Scotland," and "Ireland") will be found on page 436.





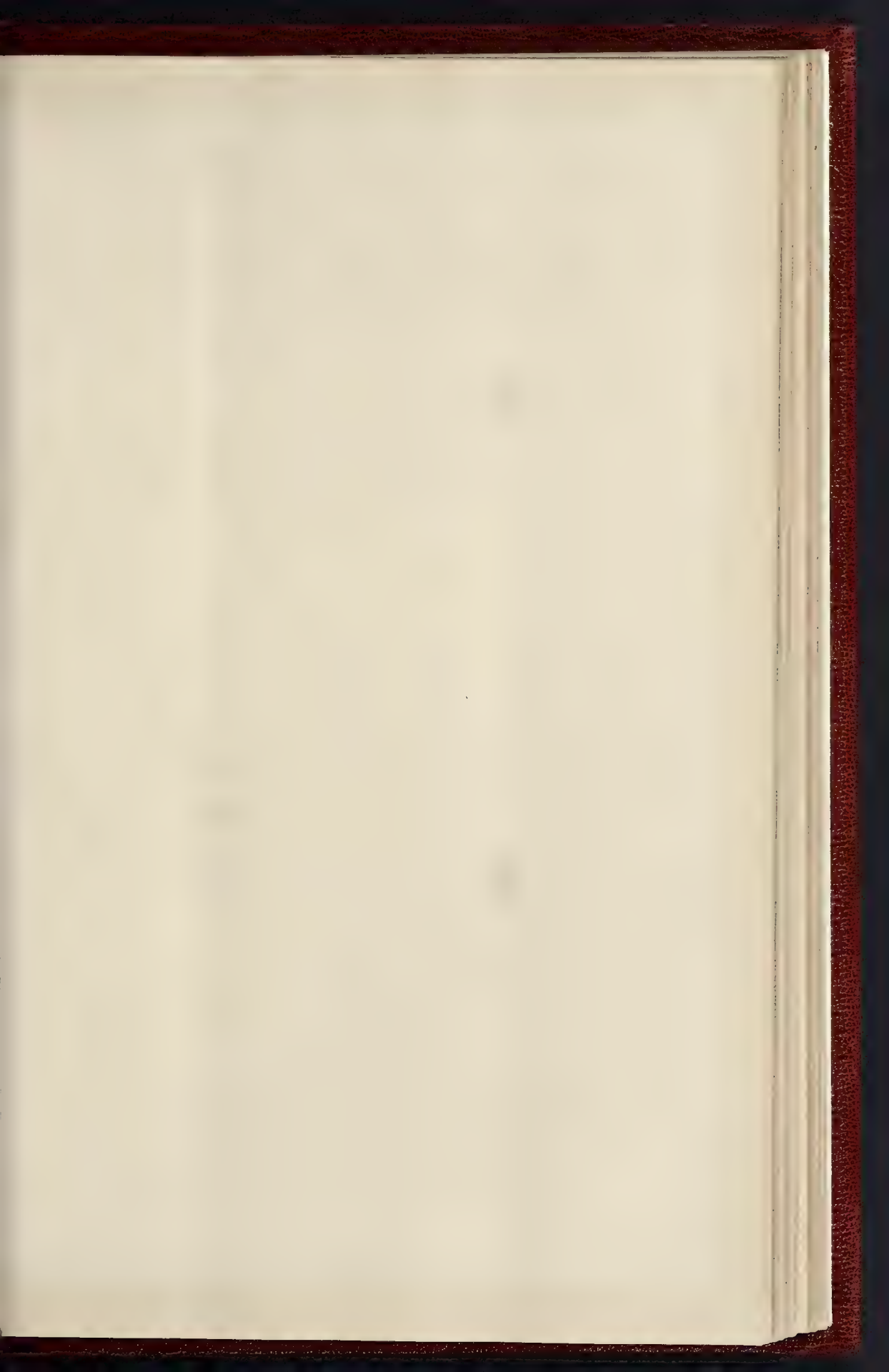
THE BUILDER, JUNE 2, 1894















DECORATIVE PAINTING "VICTOR HUGO OFFRANT"  
(FOR A STAIRCASE)

*Salon of the Champ de Mars, 1894.*

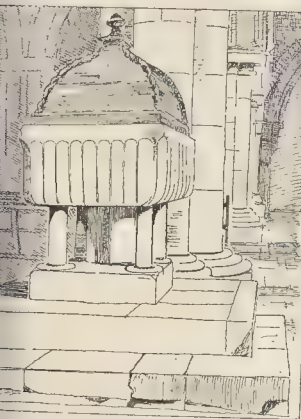


LA VILLE DE PARIS"—By M. PUVIS DE CHAVANNES  
E VILLE, PARIS)





deeply-splayed sills in order that the light all be thrown downwards. At the west end is the curious passage behind the arcade, already alluded to and illustrated, in the second bay of the south arcade from the west, immediately west of the column, is the top of the same date as the column, consisting of a square fluted bowl standing on four columns and a central drum, and raised on two steps (see sketch). Font of similar pattern are to be found



St. Mary's Church, Kilkenny, and in the parish of the formerly collegiate church of Gowran, in the county of Kilkenny. The cover, of wood, is of date. In the nave are a very large number of monuments and incised floor slabs. Eight slabs are shown on the plan. The three on the west, beginning from the west, are (1) to James O'Connell, Lord of Ballylarkin and of Ballykiff, who died 1596; (2) a sixteenth-century effigy on an altar-tomb, an interesting example of costume; (3) Richard Butler, Viscount of Arranmore, who died in 1571, an effigy in armour, with the sides of the tomb sculptured in relief with the emblems of the Passion, the arms of the Butler family, and a shield bearing the arms of the Fitzgeralds; and (4) the effigy of the Reverend Father Nicholas Walshe, Bishop of Ossory, died December 14, 1852. This is a plain altar-tomb with a marginal inscription having some good lettering. We give (see sketch) the commencement of the

In the south transept are three more tombs, shown on the plan. That nearest the south wall is supposed to be that of James, 9th Earl of Ormonde—an altar-tomb with an effigy. Next to it is a very fine altar-tomb with effigies of Piers Butler, Earl of Ormonde and Ossory (died 1539) and Countess Margaret Fitzgerald. The third tomb is one of modern date (1854), in Caen-stone, and commemorates John Butler, second Marquis of Ormonde.

In the north wall of the transept is a monumental recess, and on the north side of the choir between the organ and the triplet, a fine effigy, supposed to be that of Bishop Ledred (1318), who placed the coloured glass in the choir windows (see ante).

In the south wall of the north transept chapel is a curiously-shaped ambrey. The head is not arched, but "stepped." The Lady Chapel is now used and fitted up as a chapter-house, and the south aisle of the choir is a choir vestry. The old stone screen under the eastern tower arch has been removed, and the present fittings of the choir are modern. The wooden roofs also are new throughout—the tower vaulting only being ancient, of Bishop Hackett's time (1460). A remnant of what might be part of the old stone stalls of the choir is now in the north transept, and is known as "St. Chiarain's Chair." The seat is modern, but the two arms are ancient.

The round tower is detached from the Cathedral, and stands about 9 ft. away from the wall of the south transept. It is 100 ft. high, with a diameter of 15 ft. 6 in. at the base, and 11 ft. 2 in. at the level of the uppermost windows. It was divided into eight floors, and originally was finished with a conical roof. Traces of put-log holes remain inside, which seems evidence that the tower was built like a modern factory chimney, from the inside, scaffolding only being used for the portion near the ground and for the roof.

There are still lying on the north side of the churchyard several fragments of tombs of late date similar in character to those in the nave and south transept. A large number of these altar-tombs seem to have been made at the same period. The materials used in the construction of the Cathedral are local limestone from the immediate neighbourhood for the walling, and sandstone for all the dressed work.

#### DECORATIVE PAINTINGS FOR THE HÔTEL DE VILLE, PARIS.

We give reproductions from photographs of two of the most important decorative paintings which are about to be fixed in the Hôtel de Ville at Paris; one by M. Bonnat, "Triomphe de l'Art," now in the Champs Élysées Salon, and intended for the Salon des Arts at the Hôtel de Ville; the other by M. Puvis de Chavannes, "Victor Hugo offrant sa lyre à la Ville de Paris," now in the Champ de Mars Salon, and intended for the staircase of the Prefecture. They are further referred to in the first article in the present issue.

#### THE ARCHITECTURAL ASSOCIATION.

Continued from page 425.

If the sacristan cannot be overcome by persuasion, or a bribe, it may be wisest to go on to another place. In Spain, however, the priests seem to have a greater control over their officials, and I have found them most favourably disposed to students regarding leave to draw as a matter of course, which is our view of the question. I often pity the poor foreign student who comes, if he ever does, to England to work, where the making of drawings seems to be considered as a deduction from the value of the property, and a consequent offence, and where many persons expect to be humbly sued by the poor artist for leave to ply his trade.

As to the sight-seeing of show places, it is of course absurd to spend time in seeing what you do not like, but until you have seen it you cannot know what it is like, excepting by analogy, *i.e.*, from having seen similar places, and then you will be very likely less inclined to omit the regulation visit, perceiving that there is some advantage in having seen what the average man sees, and what he will talk about, if the subject should be discussed.

It is a saying of Goethe's that you will only find in Rome what you take there. Many places owe their attraction to associations historical and literary, and the charm is absent unless one has

some previous acquaintance with them. On the other hand, seeing such places is a powerful motive to reading, giving some actuality to the dry pages of history.

Advising students what to see is risky, because they may miss the point of interest for which the particular building is valuable, and may then fall foul of your judgment, as in the case of old buildings, now encased in bad detail, which are only to be realised by the skilled observer.

As to the time to spend in travelling, there are two plans—the rush round, and the long tour—which both have their uses, and are better not mixed. A rush round should be short, say three weeks, and should cover all the important places in the country, so as to gather a general impression of its art, and an idea of what class of work you will take up, when you come back again, and it is better to attempt no work at all.

I am all in favour of the long tour; the rush round I regard as a useful preliminary, and certainly better than none at all; but a country cannot be studied, as it is, without a residence of some length, and without the exploration of its smaller towns. A brief tour gives one a better knowledge, in one's own opinion, of the country than a longer one, when one will feel that one knows nothing, so many are the aspects, and causes, that that can be dimly seen, beneath the surface.

When I made my first rush round Italy it was spring time. Florence was all wind, and Venice all rain. The lilac only was out, and fields were bare. Where I wondered at the conclusion, was the Italy of poet, and of painter; and I resolved that next time I would go through the summer and autumn in the country. This I regard of great importance. A hot country must be seen in the hot season to understand it, and to appreciate it at other seasons also. Heat can always be supported by observing the customs of the people, which are the results of centuries of experience.

From an architectural point of view the long tour is even more desirable, because important things can be undertaken, which would not be worth doing in a hurry, and in our work the details have often a great influence on the scheme. Moreover, towns and villages that are not worth visiting, in a rapid review, are worth seeing when time is less of an object, and then we can see what a style means in its smallest work, and often how it originated.

Previous to over-running a town consider its history, for towns grow like trees, in successive layers, and street improvements are not a modern invention; thus at Rome, the work of Julius, along the Tiber, contains interesting work of the architects of his age, no other than Raphael and Bramante. Avoid suburbs and outskirts of towns, except where you have reason to expect that churches, once in the fields, have been engulfed in them. Sight-seeing is fatiguing, and over-walking should be avoided. The long streets of Paris are a great snare to enthusiasts who fail to realise the distances.

On a long tour, when visiting a town, it is best to devote the first day to going round, and it is a good plan to do this with your companion, as there is economy in sharing the fees, and it is generally advisable to make the regulation visit round the chief buildings, and often to ascend the towers, or to the roofs, both for the sake of the curiosities of their construction, and to get an idea of the city as a whole. When doing this first day's visit you should note down what appeals to you most, forming a programme of work, which you may, or may not, be able to complete, before you have to go on. You can also, thus best arrange with your friend, as to the duration of your stay, by each alternately making concessions.

Sight-seeing is education, but not study; sketching is practice in perspective; it is in measuring up that the special work of an architect consists.

That would seem to be most useful, as study, that most closely resembles your daily work, work therefore, on your usual papers, with usual pens, pencils, and colours. One would say that you will best provide against disappointment if you represent your new work in a similar style to that in which you have drawn the old. And it has often been said before that, while a painter's picture is his finished result, that of the architect is only a means to an end, the building being the product by which he is judged. I confess to a fancy, however, that there is a value in a rough style of drawing, for effects, which would shock the conservative, assuming that it is merely supplementary to sound elevation, plan, and sectional drawings. In the result, much of architecture is due to the sun, and the value of a



photograph is often that of its light and shade. I do not desire, however, to enlarge on this topic, for precept is one thing and what is successful is another, and I could only expect you not to blame me, in the result, if you had been following your own bent, which is the best advice that anyone could give—the pursuit of a method to its logical end is the truth, or reason, of many men's achievements.

Sketching is supposed to be a matter of instinct; hints are generally more wanted as to materials than as to methods; in measuring, however, there are certain difficulties which one may fairly expect to have explained. There are practically two ways of drawing buildings to scale, the first the old "measured sketch," which is a ruled elevation to scale, set up from measurement of the lower, accessible, portion of the building, what is not to be got at being put in by proportion to what is known. The other method, the measured work proper, is drawn out, not necessarily on the building, from sketches of every feature with its measurements attached, the drawings being, as it were, built up from the various details of the building. The best way to go about the latter method is to rule a diagram of the front on a block of, say  $\frac{1}{2}$  imperial size, on which your main dimensions will be put, and then to sketch all the various features on sheets of the same size, so that you can keep them all pinned together, for reference. Good measuring could be drawn out by anyone, a standard of perfection I do not claim to have reached myself. The greatest difficulty is to get the key dimensions without unnecessary measurements, which serve only to obscure and confuse your work. As to ladders and scaffolding they cannot generally be obtained, and ingenuity has to supply their place. Much can be done by measuring from above, from the parapet or cornice, from one level to another, and from window to window sideways, and up and down from a window to strings and so down to the ground. In one drawing exhibited, the problem was to obtain the total height of a building, which was a mere shell without any upper floors, the façade being a smooth stone wall, the top of which was inaccessible. Eventually it was done by slinging a plummet, at the end of a string, right over the top, and drawing up the tape, then attached to it, until it touched the underside of the top fillet of the cornice. The total height was thus obtained as well as the projection of the cornice, the height to its underside being ascertained by means of an unfinished cross wall, the top of which was nearly level with some circular attic windows. To get on to this cross wall a rustic ladder of insignificant height was only available, but there happened to be a fireplace in the wall, and as the ladder could be safely placed upright in the recess, and as it is easy to pull yourself up out of a hole, if you can get a hand on its rim, the flue proved a possible method of ascent. Thus the attic windows were measured, the height of architrave and frieze, and various other details obtained. Spires and tall roofs can be obtained by some methods given in the "Architectural Drawing-Book," but the best way is to climb up inside, as there are generally pieces of wood, nailed on to the central posts, in the case of timber work.

I admire, myself, those who do not omit the difficult and tedious work of projecting the cornices of a cornice on a circular part, or the correct setting up of tracery, or those other points of drawing which appeal only to the skilled observer. Arches and vaulting are also not so difficult to measure as they appear, and you should copy out of Spiers' work the methods of doing them, to take with you until you are efficient in them.

It appears to me that there are things which are worth measuring in a diagram style, for the sake of the proportion and outline, rather than of the detail; and, in these cases, it is surprising how quickly, by practice, such examples can be measured, so as to be drawn to one-thirtieth, second, or one-sixteenth scales. You will need only the key dimensions, one pillar, or pier, for the plan, and the general heights only, for the section or elevation, and can put in the detail of the style as you like; but such work should, of course, be distinguished as a measured sketch. Measured work is so laborious that it is not surprising that cheaper methods are common, but the putting of dimensions on to a sketch is not, to my mind, of the value usually ascribed to it; the proportions are not to be obtained thus, and, as a rule, such dimensions are inadequate, if you try and draw out the work; while the possession of old work, to the scales you

are accustomed to, is of great value. What architects differ most in, is the number of features that can be crammed into a façade of a given length, and how can scale be learnt save by experience of old work?

In conclusion, the advantages of travel are questioned mostly by those who have not been abroad, and a chance of going modifies much our views of the subject. Anyone will admit, of course, that why the advantage is often little, or none, is due to the spirit in which it is undertaken. No one can be taught against his will, and an atmosphere of prejudice will prevent any man learning the most obvious facts. The value of going more than once lies in the fact, that the first impressions are most distracting, and I think that a rush round, which gives some general idea of what there is, has a great value, as a prelude to a second more serious working tour. And I think this first rush round of the beginner should be taken much earlier, in the pupil stage, or, better still, before, as nothing should so open the eyes of the beginner as to what architecture means, as a sight of the grand buildings of the past; moreover time is not lost in this wearing off of the novelty of fresh impressions, as on a second tour work can be better done, the mind being less distracted.

From other points of view, it must be remembered that we live on an island and, by imports, in art as well as in food, and this importation has been continuous, hence old work, no less than modern, is best understood when foreign originals have been seen. Canterbury choir is not less liked when you have been at Sens, nor the Reform Club when you have been in seeing Spanish features, in St. Mary's, and the Cathedral, at Bristol. Architecture is wider than nationality, which shows itself mainly in the class of building chiefly required being better treated in one country than another, and in a certain general stamp of the characteristic of each race, such as refinement, grandeur, vigour, &c., in less or greater quantities.

The greatest abuse of travel is heedless importation of features that have no previous root over here, instead of learning how to modify the old, for the work of the present. Imported work usually dies out, however fashionable it may be for a time, and a design should not require to be understood by the light of what has been done exclusively elsewhere.

That there is nothing more to learn, owing to the numbers who have been there before you, is a pure delusion. It is extraordinary how the obvious is overlooked. Hundreds had seen the Town Hall at Piacenza, but when brickwork was built on granite, with no division between it was justly regarded as a novelty; and, as Bacon says somewhere, chance is more responsible than pursuit for most of our discoveries, what is known being but a particle of what is passed over.

The importance of travelling may easily be exaggerated, but as now-a-days the world in general travels, the architect should at least have seen the more important monuments, as his client will very likely have had that advantage.

From the point of view of examinations I would prefer to spend the fees of all the courses in seeing, rather than hearing about, the buildings, and architecture, in question. If you have been at Vicenza, Palladio will never stump you, and Scamozzi, Ictinus, and others, when you have seen their works will be no burden on your memory.

The greatest, however, of all the advantages of travel is the acquirement of freedom. Every generation has, in art, as in other matters, its own cant ideas, and phrases. Travel is emancipation, in that art is wider than convention, and a knowledge of all the styles of the past is the best protection against the formulas of the day. When told of such and such mysterious qualities to aim at, and this or that method of doing it, you can reply effectually by quoting some leading building, treated on the reverse method; and if that be excluded, there will always be another, for art is wide, and principles are hard to stretch; as it has been said, the subtlety of nature is beyond understanding, so that the theories of mankind are a kind of insanity, only there is no one to stand by and observe it.

Mr. R. Phéné Spiers, in proposing a vote of thanks to Mr. Bolton, said that the paper suggested very early recollections, and when he said that his first Italian tour was made in 1860, he might be looked upon by many of those present as perhaps an old hand. In many of his early tours he was a great economist, having been

brought up in the French school, which, as Mr. Bolton had said, was a thrifty one. In arriving at a town, it was well to leave the luggage at the station, and, taking only a handbag, to walk up one recognised the class of inn desired. In Italy it was necessary to make one's price, otherwise the traveller would be looked upon as a fool, or a man of means to whom price was no object. I never travelled now with a portmanteau, as restricted freedom of movement, nor did he ever take a rug. Mr. Spiers here showed a knapsack bag he had had made in 1861, worn until three years ago had accompanied him in all his wanderings. It was recommended to him by his French companion in Paris, and was extremely convenient. An overcoat lined with silk he considered sufficient for a wrap. It was most important to make out a plan of the tour and determine the approximate time to be spent at the several stopping places. He had also for years collected the names and particulars of hotels, and the prices was always at the disposal of any students who liked to call upon him at the Academy.

Mr. Banister F. Fletcher (Hon. Sec.) said should like to second the vote of thanks, as he had had the pleasure of travelling with Mr. Bolton. When one took a long tour, as Mr. Bolton had, the question of the advisability of taking a drawing-board came in; but for an ordinary tour of weeks or so the size suggested by Mr. Bolton was rather too much, and a quarter imperial drawing block would be preferable, which could be used with a T-square. He considered that lodgings were preferable to hotels, because one could then have meals at the restaurants; one was more independent, and could study more thoroughly the people of the country in which one was travelling. As a late Academy student, he thanked Mr. Phéné Spiers for the valuable advice he had often given to him when arranging a tour.

The vote of thanks was then put and cordially received, and Mr. Bolton having replied, the meeting separated.

## THE LONDON COUNTY COUNCIL.

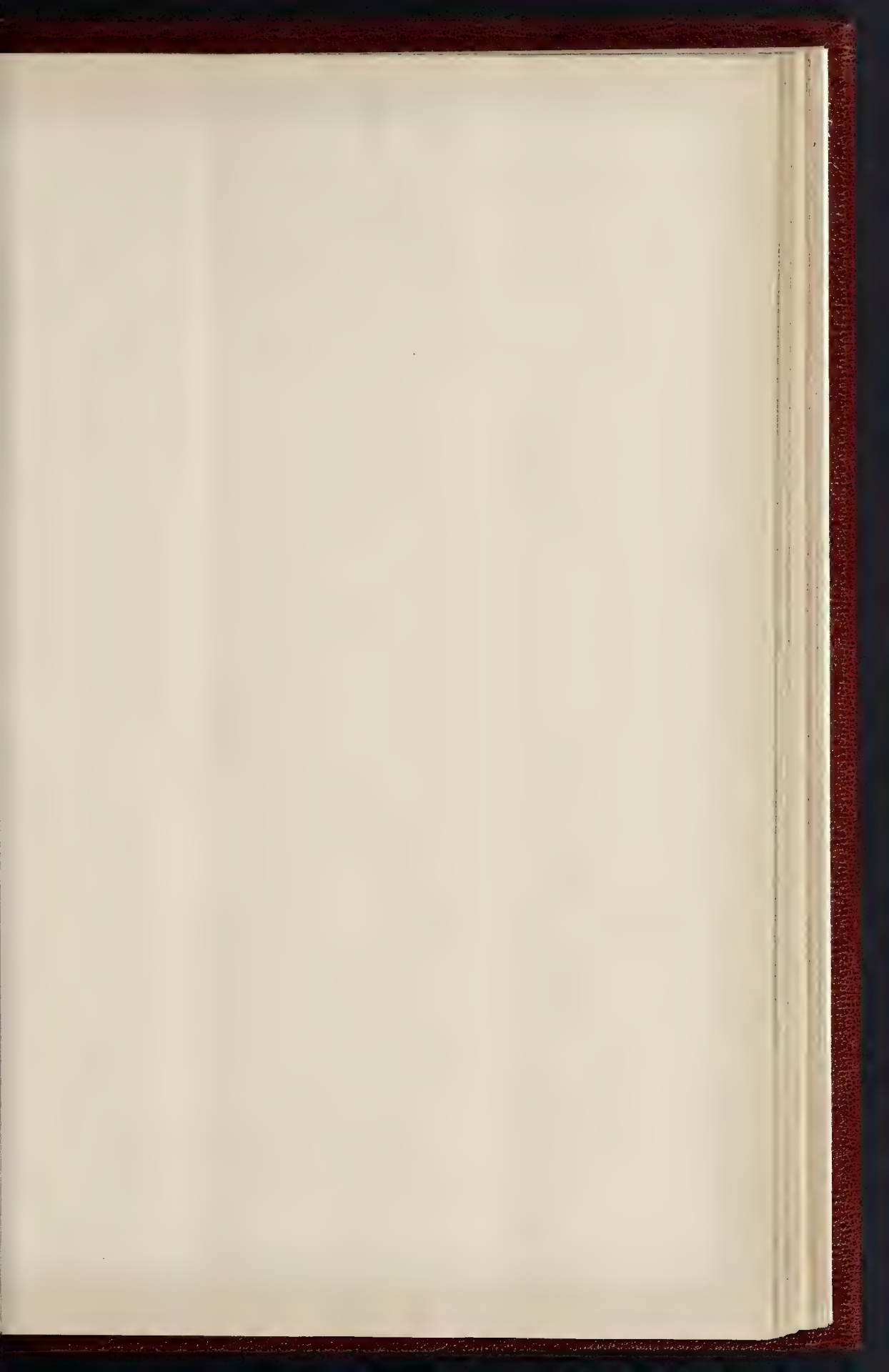
The first meeting of the London County Council after the Whitsuntide recess was held on Tuesday at the County Hall, Spring-garde, Sir John Hutton, the Chairman, presiding.

*The Council Chamber.*—The adjourned report of the Establishment Committee was as follows: the recommendation being agreed to—

"Consequent on the repeated applications for newspapers for seats in the reporters' gallery, have had under consideration the question of enlarging the gallery. The architect has prepared a plan showing how the enlargement can be effected. The present gallery accommodates 21 press representatives, and according to the plan submitted increased accommodation will be provided for 102 more. From the nature of the work the architect is unable to give a close estimate, but is of opinion that the probable cost would be about £700. We think it very desirable that the proposal should be enlarged, and we accordingly recommend—

"That, subject to an estimate being submitted to Council by the Finance Committee as required by statute, an expenditure of a sum not exceeding £700 be authorised for the purpose of enlarging the reporters' gallery; that the work be carried out without the intervention of a contractor, and that the plan and estimate referred to the Works Committee for that purpose."

*Additions to the Fire Brigade.*—Mr. Carrington, on behalf of the Fire Brigade Committee, submitted a long report, proposing erection of new fire stations and appliances, the employment of eighty additional firemen. He said the Council had already expressed opinion in favour of the idea of increasing means of protection from fire, according to definite scheme which had been prepared by committee dealing with the whole of London, but was anxious that the carrying out of the proposals should be spread over a number of years. The committee's scheme involved a capital expenditure of £100,000, and an increased annual charge of £30,000, for twenty years, when, as a considerable amount, the loan would have been paid off, there would be a diminution of the year ending March 1895, was only £6,000. They now asked Council to give its sanction—(1) to a new station at Streatham; (2) to a street station pending erection of the permanent building; (3) to the fixing of five fire-alarms in the neighbourhood of Streatham; (4) to a fire-engine station at Perry Vale; (5) to a fire-engine station at Shepherd's Bush; (6) to a sub-fire station or a street station at each of the following

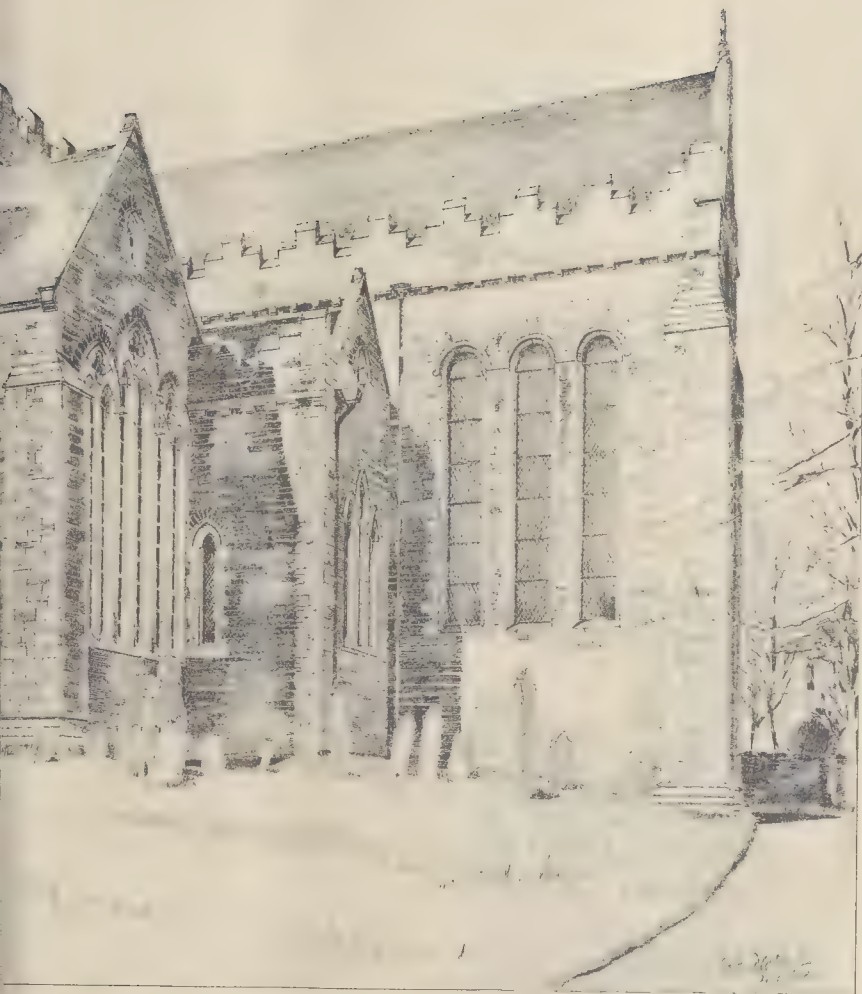






ANCIENT CATHEDRALS OF IRELAND

No. 3. ST. CANICE, KILKENNY



AK PHOTOGRAPHIC CO. 100 N. 1ST ST. ST. LOUIS, MO. 1894

AWN BY MR. ROLAND W. PAUL.  
THE SOUTH-EAST





localities:—North End-road, Fulham, High-road, Kilburn; Strand (near the Law Courts); Piccadilly Circus; High-street, Hammersmith; Burdett-road, Limehouse; North Woolwich; Lee Green; Battersea Park-road; Brixton Hill; (7) to additional hose-cart and fire-escape stations or hose and ladder truck stations at Hornsey-rise; Aubert Park, Highbury; St. Leonard's-road, Poplar; and Rye-lane, Peckham; (8) to additional fire-escape stations at Wandsworth-bridge-road, Fulham-palace-road, Blythe-road, Hammersmith; Alpha-road, Regent's Park; Haverstock Hill, top of; Mill-lane, Hampstead; Malden-road, Kentish Town; Victoria Park-road; Bow Common-lane; Beresford-square, Woolwich; Burnt Ash-road, Lee; Mayow-road, Forest Hill; Lower Street-ham; Loughborough Junction, instead of Coldharbour-lane, as originally proposed; Balham Hill; East Hill, Wandsworth (in the complete scheme fifty new fire-escape stations are provided for); (9) to steam fire-engines to be stationed at Notting Hill, St. John's Wood, Bethnal Green, Isle of Dogs, and West Norwood Stations; (10) to arrangements for the purchase of appliances and gear needed for the additional stations, and for enrolling and training the eighty additional men required for the duties to be commenced during the current financial year.

After a long debate the whole of the Committee's recommendations were agreed to.

#### Widening of Wellington-street and the Strand.

—The Improvements Committee submitted a scheme for the widening of Wellington-street between the Strand and Lancaster-place to about 100 ft. and the Strand between Wellington-street and Savoy-street to 80 ft.\* The report of the Committee, after detailing the previous recommendations, proceeded as follows:

"The Council on April 30 last referred the recommendation back to us for further consideration, especially with regard to the expediency of applying to this case the principle of betterment. We have given full consideration to the subject, and have negotiated further with the Duchy of Lancaster, with the result that the Duchy is willing to withdraw clause (e) relating to betterment from the conditions attached to the offer, upon the Council agreeing to pay the Duchy 38,760*l.* instead of 32,000*l.* We are advised that the 6,760*l.* which the Council would save by not insisting upon the withdrawal of clause (e) would fully represent the amount of the Duchy's interest which might possibly be intercepted hereafter by the Council if it succeeded in obtaining Parliamentary power to apply to this improvement the principle of betterment. The 6,760*l.* can therefore be taken as a recognition of the principle of betterment as proposed to be applied in the case now before Parliament, and we have decided to advise the Council to accept the Duchy's offer of 32,000*l.* and the conditions (a) to (g) inclusive set out in this report, and Wellington-street at its junction with the Strand is at present about 64 ft. wide, and the Strand at this point has a width of about 68 ft. Owing to the inadequate width of the road the traffic is frequently congested, and the widening of Wellington-street is therefore, in our opinion, a necessary and urgent improvement. The estimated cost of the proposed works is 2,700*l.* The widening of Wellington-street will have to be undertaken sooner or later, and if the present very favourable opportunity for effecting the improvement without any outlay for compensation in respect of leasehold and trade interests be lost, the cost at a future time will be probably five or six times greater than now, a result which we cannot think the Council desires to bring about. We recommend—

"That, subject to an estimate being submitted to the Council by the Finance Committee as required by a Statute, the Council do accept the offer of the Duchy of Lancaster to sell to the Council, for 32,000*l.*, and upon the conditions (a) to (g) inclusive set out in this report, the necessary authority for the property required for widening Wellington-street and the Strand, and do carry out the improvement as shown upon the plan submitted with this report; and that the solicitor be instructed to prepare the necessary agreement with the Duchy."

Mr. Hubbard moved the following amendment:

"That while appreciating the efforts and sharing the anxiety of the Committee to carry out this and other improvements which are greatly needed in various parts of London, the Council, in view of the heavy and increasing burden now borne by occupiers of rateable property, and the impending changes in the incidence of taxation proposed by the present Government, whereby land values shall be made to contribute towards the administrative expenses of the State, and the purchase price of land will be greatly reduced, is not prepared to proceed further in the matter."

The Vice-Chairman urged that full recognition had been given to the principle the Council had been so long fighting for, they should seize the opportunity to carry out what would be a very

great improvement at this crowded part of the Strand.

The Council divided, with the result that Mr. Hubbard's amendment was rejected by fifty-nine to twenty-seven.

Alderman Beagcroft objected to the improvement being carried out strictly on the lines of the plans submitted, and he moved an amendment to the effect that the Council agreed to the purchase of the land for 32,000*l.* with a view to carrying out the improvement, and this on a division was carried by forty-three to forty-one.

Dr. Collins moved to add to the recommendation words to the effect that the purchase was made on the understanding that the 6,760*l.* was allowed by the Duchy in lieu of betterment.

The debate on this amendment had not concluded when the fixed hour for the adjournment of all opposed business arrived.

#### COMPETITIONS.

**FEVER HOSPITAL, TOTTING GRAVEY AND HITHER GREEN.**—The competition for two fever hospitals, which the Metropolitan Asylums Board propose to build, has just been decided. The first hospital is to be situated at Tooting Graveney, and will be called the "Fountain Hospital"; the second, to be called the "Park Hospital," will be at Hither Green. Mr. Alfred Waterhouse was the assessor, and the result of the competition is as follows:—*Park*, 1st premiated design, Mr. Edwin T. Hall, 57, Moorgate-street, E.C.; 2nd, Messrs. Leonard Stokes and George T. Hine, 33, Parliament-street, S.W.; 3rd, Messrs. Charles and Wm. Henman, 64, Cannon-street, E.C. *Fountain*, 1st premiated design, Mr. A. Hessel Tiltman, 70, Torrington-square, W.C.; 2nd, Messrs. Beeston & Burmester, 30, Lincoln's-inn Fields, W.C.; 3rd, Mr. Wm. Emerson, 8, Sanctuary, Westminster.

**SCHOOLS, GILLINGHAM AND GRANGE UNITED DISTRICT.**—The plans of Mr. M. Chambers, Chatham, have been selected in this competition.

**THE GIZEH MUSEUM.**—The Cairo correspondent of the *Times* states that the Egyptian Government intend shortly to invite European architects to furnish plans for a new building to contain the exhibits now included in the Gizeh Museum, and to give premiums to the amount of a thousand pounds for the three best designs.

**TOWN HALL, THE CAPE, SOUTH AFRICA.**—The first premium, 200*l.*, offered by the Cape Town Council for the erection of a new Town Hall, has been awarded to Mr. Harry A. Reid, in conjunction with his partner, Mr. Green, both of Johannesburg. The contemplated outlay, not including the upper part of the clock tower, is 50,000*l.*

**SCHOOL, SUNDERLAND.**—A special meeting of the Sunderland School Board was held on Tuesday to consider competitive plans for the Hudson-road School. Fifteen plans had been sent in. The General Purposes Committee reported that they had examined the whole of the plans for the school submitted for competition, and recommended that the premiums should be awarded as follows:—1st, and 50*l.* to Mr. C. T. Brown; 2nd, and 20*l.* to Mr. J. Eltringham; 3rd, and 10*l.* to Messrs. Oliver & Leeson (Newcastle). Mr. Singleton moved, and Mr. Davison seconded, that Mr. C. T. Brown be engaged to undertake the duties of architect on the usual terms. This was carried, and the meeting terminated.

**BOARD SCHOOL FOR THE LANCASTER SCHOOL BOARD.**—In connexion with the competition for new schools, Bowerham-road, for nearly 1,000 children, the Lancaster Board have placed first the plans sent in by Mr. Robert Walker, architect, Windermere, and have awarded the premium of 20*l.* to him. The premium does not merge into the commission. The school is planned in a T shaped form for 660 boys and girls (mixed), and 300 infants in a separate building.

**SANITARY INSTITUTE.**—At an Examination for Inspectors of Nuisances, held at Hull on the 25th and 26th ult., the following seventeen Candidates were certified to be competent, as regards their sanitary knowledge, to discharge the duties of Inspector of Nuisances:—Arthur Herbert Atkinson, Hull; Charles Crowther, Dewsbury; Alfred Cleave, Manchester; Henry Hilton, Blackburn; Alfred Jesse Hocken, Hull; Charles Jones, Birkenhead; William Henry Jones, Birkenhead; Fred. Jowett, Wetherby; Miss Margaret Jean Keay, Derby; Alfred Henry Kendall, Leeds; Miss Henrietta Kenaley, Watford; William Knox, Ayr; Robert Scott, Hull; John William Shaw, Gimsby; Herbert Charles Sugden, Bingley; Roland Arthur Thomas, Menai Bridge; John James Warrington, Eland.

#### Correspondence.

To the Editor of THE BUILDER.

#### THE HEATING AND VENTILATION OF THE HOUSES OF PARLIAMENT.

SIR,—Your correspondents appear to be drifting into unknown depths. This is not the time nor the place to enter into an apparently endless theoretical discussion on elementary facts, embracing the displacement, compression, &c., of air, in connexion with the complicated and special subject of ventilation, and, in closing this correspondence, so far as I am concerned, I will deal more with historical facts than elementary ones, and with the results obtained in the hard school of practical experience.

Ventilation is a science—quite distinct from that of architecture—and it really requires almost the close study of a life-time to master properly all its intricacies. It is unreasonable, therefore, to expect architects to be experts in heating and ventilation; and my lengthened experience in different parts of the world goes to show that the better class of architects never profess to have any special knowledge in this direction, but that they generally—as one of your correspondents states—work with specialists in perfecting any system which both are agreed will secure the desired results.

In answer to the specific questions referred to by the same correspondent, I would again refer him to my report, wherein he will find a full and detailed reply to his queries.

I have made no new proposal "to carry out a scheme of ventilation based on a dual system of propulsion and extraction" for the Houses of Parliament, as has so erroneously been asserted. I have in my report fully explained the present system in use, have pointed out what I consider are the defects, and have suggested and recommended some simple but effective remedies, all of which I have most distinctly pointed out can be carried out if necessary by the mechanical staff employed at the Houses of Parliament, under the supervision of the Resident Engineer.

This trouble of inefficient ventilation in large legislative buildings—notwithstanding the enormous amount of fresh air that can be passed through them sometimes "without ventilating them"—as the eminent Glasgow architect (from whom I quoted in my last letter) so pitifully put it, is not at all confined to the Houses of Parliament in this country. Some time ago I also had the privilege of carefully examining the heating and ventilating arrangements of the United States Capitol in Washington, where, though about double the amount of ventilation per seat is given, both in the Senate Chamber and in the House of Representatives, to that allowed in the House of Commons in winter, the same evil, in the destruction of the atmosphere by warming it over a too highly-heated medium like steam-heat, appears to be experienced.

Considerable interest in America has consequently been taken in the report on the heating and ventilation of our Houses of Parliament, in which I have endeavoured to point out the true remedy, and I have just had the pleasure of mailing copies of the report—by special request—to the architect and superintendent of the Capitol, and to the chief engineers, respectively, of the Senate House and of the House of Representatives in Washington.

For many years the best and most ventilating installation at the Capitol in Washington was the greatest and most perfect example of "propulsion pure and simple" in the whole world. Two large fans, one of them 14 ft. and the other 12 ft. in diameter, one fan for each House, were (and are still) used for forcing in air under pressure on the Plenum system. After years of experience, however, it was found absolutely necessary to adopt Extraction as well, in order to ensure the certainty of the vitiated air being got rid of under all states of the atmosphere. Consequently, some years ago, two additional fans, each 6 ft. in diameter, were erected in the basement, and so arranged that the vitiated air was extracted from the ceiling of each House. This combination of Plenum with Extraction is still in use, and gives general satisfaction, so far as the ventilation alone is concerned. During winter, however, the evil results experienced in the Houses of Parliament on this side, by the overheating of the air by steam-heat, already referred to, still appear to exist at the Capitol in Washington.

The London Law Courts were, I presume, the greatest example in this country of "propulsion pure and simple" in ventilation, and there, again, we find, from the evidence of the Surveyor to Her Majesty's Office of Works, given in the 1891 report of the Select Committee of the House of Commons on Ventilation, that, before long, Extraction had to be resorted to, in combination with the Plenum system, in order to make the ventilation anything like tolerable and bearable. Mr. Taylor, the surveyor in question, stated, "We had to put the fans out of use until we created a much greater heat in the roof itself. The roofs were not warmed at all, as Mr. Street left them; they were almost open to the outer air, and in winter were absolutely cold. I had to carry a large system of steam-pipes round the whole of the roof, and to

\* See the *Builder* for March 27, p. 217, and April 24, 292.



create a current through the ceiling, and then increase the power of the pulls at the outlet."

As regards the National Liberal Club, I may remind your other and later correspondent that the ventilation planned on the pure and simple Plenum system, and carried out regardless of cost about seven years ago, turned out such a failure that the Committee on my suggestion about two years ago requested the successors in business of the firm who planned and carried out the work to report as to how matters could be improved.

The report of that firm was undoubtedly a modified condemnation of the system, and the remedies referred to by your correspondent and proposed by that firm were mainly to subdivide the heating pipes, &c., into sections, to improve the extraction, and to heat certain of the larger rooms, &c., by direct radiation from steam-radiators placed in the rooms, &c.

How your correspondent can, in the circumstances, quote the unfortunate example of the National Liberal Club, in support of the Plenum system of ventilation is beyond my comprehension.

As regards the same correspondent's assertion, that heating by hot water instead of steam "would certainly be a step in the wrong direction," I will only say that, according to this statement, my own practical experience of thirty years must have completely misled him, and our cousins on the other side of the Atlantic must also be stepping backward very rapidly "in the wrong direction."

If ever any mechanical arrangement was developed into almost a science during the last fifty years in the United States and Canada, it has been that of low-pressure steam-heating. Well, during the last ten years, and more particularly during the past five or six years, steam-heating in America has almost entirely given way to hot-water-heating, on the grounds, principally, of health, economy in the working, and easier regulation. To-day I have the best authority for knowing and stating that the ratio of the two systems being erected by steam-fitters and hot-water engineers throughout the whole of northern America is something like 90 per cent. for hot water, and only about 10 per cent. for steam-heating appliances.

Considering that the House of Lords is admittedly so much better ventilated by extraction alone than the House of Commons is by propulsion and partial extraction, and that the air passing into the House of Lords is if anything fresher, this air being also cleansed and warmed or cooled and given the necessary humidity, &c., and handled as desired, without any fan propulsion, by "extraction pure and simple," I think it may be taken for granted that extraction, rightly applied, is infinitely better all round than propulsion, though the two systems can, no doubt, be sometimes most usefully and efficiently combined.

Returning, again, to your architect correspondent, I cannot conceive how any one possessing the most elementary knowledge of ventilation could pen the following sentence, which appears in your correspondent's first letter:—

"And to provide outlets, therefrom, in such positions and so conceived that the air may, after being vitiated, quickly pass away without being obstructed or accelerated by movement of the outer atmosphere or any other influence." The supposition conveyed in the latter part of this paragraph, that air inside a building, under certain, or even any, outside atmospheric conditions, can "quickly pass away" without "being accelerated" by any influence whatever, is, to my mind, an absurdity. In conclusion, I can only repeat that so long as architects hold such views, so long will our public buildings stand every chance of being examples of inefficient and defective ventilation.

JAMES KEITH, Assoc. M. Inst. C. E.

SIR,—I feel sure that Mr. Keith cannot have a personal knowledge of the arrangements for the heating and ventilating of the National Liberal Club, otherwise he would not in fairness have expressed his opinion in such forcible terms as to condemn the system applied at the above club. I must call his attention to the fact that the apparatus was completed in the year 1887, and left to the satisfaction of those concerned. Unhappily, the care of the arrangements was placed in the hands of those who, unfortunately, did not give it the attention that was necessary for the working of such a system, and in consequence dissatisfaction and complaints ensued. Alterations have been made from time to time since the apparatus was erected, and one in particular, viz., the applying of forced draught to the boilers, which destroyed the smoke shaft passing through the ventilating shaft.

I think it is only justice to the late W. W. Phipson, engineer, the contractor for the above, who during his lifetime executed the heating and ventilating of a number of our public buildings and other works for many of our leading architects, that this explanation should be given.

C. H.

#### WROUGHT-IRON GATES, CARSHALTON PARK.

SIR,—Many of your readers will know the splendid wrought-iron gates which stand on the eastern side of Carshalton Park, guarding a drive and entrance long since disused. It is only a few weeks ago that

their almost total destruction was brought to my notice while walking from Wallington to Sutton. It seems that during last winter one of the large trees forming the avenue was blown down, and its giant branches have crashed right through the centre of the gates. The cresting is lying in fragments on the grass; the left-hand gate is ruined, and the other has suffered hardly less severely; the whole appearance is now quite tragic to anyone who values these examples of English art.

Only last June, when accompanying Mr. J. Starke Gardner on an expedition to see the famous lock of Beddington (which we duly found in its place of honour at the end of the hall), I took the photograph of these gates, which I enclose. Owing to the strong western sun, the view had to be taken from one side, and I fear it is quite unsuitable for reproduction as an illustration of the gates, but it is probably the latest record of their original condition. You will remember that they are the centre of a long composition, ending with carved and moulded stone piers, supporting statues of Diana and Actæon.

I also enclose views, taken on the same occasion, of the gates at Carshalton House (where the crest has since disappeared) and Beddington Hall (showing the initials of one of the Carews), which are evidence of how much interesting ironwork there is in this neighbourhood.

R. LANGTON COLE.

#### SEWER AND DRAIN VENTILATION.

SIR,—I have myself, with friends, put to the practical test the working of this so-called system of ventilation large districts under all conditions, and where the work has been performed by men who, judging by the way the work is done, require no lessons from Mr. Buchan, and with the result to justify entirely the assertions Mr. West has made.—

J. C. KENWOOD.

\* \* One system may have been a failure under some conditions, but it does not follow that the other one is right. We agree with Mr. Buchan, at all events, in the general opinion that "to use the soil-pipes of our houses to ventilate our sewers is a dangerous plan."—*Li.*

#### THE ARCHITECTURAL ROOM AT THE ROYAL ACADEMY.

SIR,—My statement may well be looked upon with suspicion by the architectural world, but I can assure you I counted between forty and fifty people in the Architectural Room of the Academy at one time (inclusive of those sitting down) on Saturday last.


Things are looking up.

A.R.I.B.A.

#### The Student's Column.

#### THE STRUCTURE AND PHYSICAL PROPERTIES OF BUILDING STONES.—XXII.

##### 12 THE YORKSHIRE DISTRICT.

 LARGE part of north-east Yorkshire is occupied by oolitic rocks, which yield a number of building stones, not much known outside the area. The superabundance of Carboniferous sandstones in the county has, apart from other reasons, rendered the trade in oolitic limestones comparatively unimportant. We are not personally acquainted with the district, but the particulars which follow are derived from official sources, principally from the recently-published memoir of the Geological Survey by Mr. Fox Strangways.

The building stones of north-east Yorkshire are obtained from the following geological horizons:—

1. The Upper Calcareous Grit.
2. The Upper Limestone.
3. The Middle Calcareous Grit.
4. The Passage Beds.
5. The Lower Calcareous Grit.
6. The Kellaways Rock.
7. The Upper Estuarine series (Moor Grit).
8. The Middle Estuarine series.
9. The Millpore Bed and Cave Oolite.
10. The Lower Estuarine series.

The first horizon yields a stone known locally as North Grimston cementstone in the neighbourhood of Langton, Birdsall, and North Grimston. It breaks into short flaky pieces, and has occasionally been used in the construction of farm buildings.

The Upper Limestone division yields probably the best stone for interior and ornamental purposes in the district. It is quarried principally at Hildenley, where the material is extremely fine-grained, and somewhat resembles indurated chalk. Its structure is remarkable, showing a considerable amount of chalcadonic silica, not only interspersed amongst the particles of the stone, but as siliceous fossil shells. The latter, especially a small species of *Ostrea*, is thus converted into such a hard substance that the masons' chisels

suffer in consequence, whilst the homogeneity of the stone as a whole is interfered with. Nevertheless, average chemical analyses indicate that it contains about 95 per cent. of carbonate of lime. It is of a whitish cream colour, and the section in the quarry gives about 15 ft. of workable stone in thin beds, the thickest bed being about 22 in. The material has been employed, amongst other places, in the Chapel at Castle Howard and for interior work in Kirkham Abbey. The fine state of preservation of the mouldings in these ruins, which have been exposed to the weather for many centuries, testifies to its durability as a building stone.

The Middle Calcareous Grit yields massive beds of freestone at the western end of the vale of Pickering, on either side of the river Rye above Helmsley. It has been quarried at several places in Thornton Dale, where the oolitic beds used for building are up to 18 in. in thickness, but the same quarries yield calcareous sandstones as much as 5 ft. on the bed. In structure, the limestone beds (which are really the top of the Lower Limestone division) may be described as impure and slightly oolitic, whilst some are very shelly. The best-known quarries in the Middle Calcareous Grit horizon, however, are those at Pickering, where the following beds belonging to this series are seen just below the Castle, according to Mr. Fox Strangways:—

##### Section in Pickering Quarries, East side.

	Ft. In.
Solid beds of limestone .....	5 6
Rubby oolite, with coarse psilolite bed .....	4 0
Thick irregular bed of limestone ..	2 6
Oolite with irregular blue-centred limestone .....	4 0
Thin limestone bed .....	0 6
Smooth limestone .....	1 0
Impure limestone .....	5 4
Soft yellow freestones with calcareous bands .....	11 0

The beds are stated to be so variable, both in structure and thickness, that the above only furnishes a general idea. They really consist, says Mr. Fox Strangways, of an irregular series of sandstones and calcareous beds, in which the sandstones largely predominate, especially towards the lower part; in the upper part several calcareous bands or irregular lenticular masses set in. Examples of Pickering stone may be seen, not only in the town, but in the large mansion at Duncombe Park, and the college at Ampleforth.

There is no lack of quarries in the 4th division—the Passage Beds—especially in the northern part of the Tabular Hills between Hackness (near Scarborough) and Kirk Dale, but they are for the most part shallow, and yield nothing but second-rate material, used in the construction of inferior buildings and for field-walls. The rock is known in the vicinity of Hackness as "Wall-stone." In structure, it is coarse and rubby, generally splitting into large slabs.

The Lower Calcareous Grit, according to the Geological Survey Memoir before alluded to, is employed as a building stone along the whole range of its outcrop, from the coast at Scarborough to the Hambleton Hills, and throughout a great part of the Howardian Hills. It is said, however, to be too soft, as a rule, to be of much value, and is inferior to many of the other beds found in the district. The more noted quarries, as producing the best stone, occur along the southern outcrop of the formation along the Howardian Hills. Foremost amongst these is the famous Park Quarry, near New Malton, the micro-structure of which indicates that it is a sandstone composed of minute quartz grains, with an argillaceous cement, and is of whitish brown tint. The workable stone is 10 ft. in thickness, the beds being from 16 to 20 in. in depth. It has been used, amongst other buildings, in the construction of Castle Howard. At Appleton-le-Street are several quarries from which came the pilasters of the south front, and the stone used in the stabling of that castle. Bields Quarry, at Malton, is also well known, and yields the following section:—

##### Section at Bields Quarry, Malton.

	ft. in.
Buff-coloured, gritty, sub-oolitic limestone and brash .....	6 0
Bed occasionally containing much fine-grained calcareous grit .....	2 0
Buff-coloured gritty limestones, with a very few straw-coloured granules, in thick beds, with thin brashy partings .....	12 0
Calcareous gritty freestones, alternating with blue stone .....	27 0



The large quarry at Birdsall has been worked for many years, and has provided material for many important buildings in the vicinity. The general composition of the Lower Carbonaceous Grit is a yellow calcareous sandstone with cherty bands, &c., passing down into softer sandstones, which become shaly towards the base. Mr. Fox Strangways remarks that although the term "grit" is applied to this rock, there is very little of it that would be called a grit amongst older formations; in fact, many of the sandstones, even of the Lower Oolite, are harder and firmer and far more gritty than this bed.

The quarries in the Kellaways Rock are not so actively exploited as they were a few years ago, although yielding excellent freestone at Hackness and Levisham. The formation may be described as a soft, thick-bedded sandstone of a brownish-yellow colour; in certain localities it is very ferruginous, when it assumes a deep red colour, and is hard and compact. In the centre of the district it is usually a porous, friable sandstone. Like many other freestones, it is easily worked when first quarried, but hardens on exposure, when it forms a durable building stone, as witness the church and hall at Hackness, the museums of Scarborough, York, &c.

The sandstones of the Lower Oolite division are largely employed as building materials in the district. They are, as a rule, coarse in texture, massive, and suitable for structures where strength is required, and for general ashlar. Commencing with the Upper Estuarine series, we find an important bed of sandstone—the Moor Grit—at its base. This is said to form an excellent building stone, and is quarried at numerous places—notably at Cloughton, Harwood-Dale Moor, Sneaton, Grinkle-leak, Wygrave, and Tidkinhow. Between Danby station and Easington a sample of the stone, derived from a large opening, was described by Mr. J. A. Phillips.\* Under the microscope this rock is seen to be almost entirely composed of quartz grains, more or less sub-angular, between which a deposit of transparent crystalline quartz acts as a cement. It is white and fine-grained, being often so compact as to be entitled a quartzite rather than a grit. In some places, we may remark, the Moor Grit splits into slabs of great size, and furnishes a good flagstone.

The Grey Limestone horizon produces no building stones of any importance in the district, though it has received the appellation of "pier stone," from the circumstance that it was used in the construction of the harbour pier at Scarborough.

At Hayburn Wyke and some other places the sandstones of the Middle Estuarine series have been quarried for years, and the material has a good reputation, being employed at Scarborough and elsewhere.

The Millpore Bed is a very hard siliceous rock, breaking up into rough irregular blocks, and has been used for marine works in the district. It is especially suitable for the formation of breakwaters and sea-walls.

The Cave Oolite, on the other hand, is a soft, yellow oolitic limestone, sometimes called "Cave marble," though how a soft stone of this description could be polished into a marble we know not. In the neighbourhood of Brough and near Cave are several quarries; material from the former is used in the construction of the docks at Hull.

The Lower Estuarine series produces the most celebrated building sandstones in the district, particularly at Aislaby, from which place Whitby Abbey and many London buildings have been supplied. In structure it is a light brown sandstone having quartzose grains of moderate size, with an argillaceous cement; small pieces of mica and some carbonaceous matter are present. The workable stone is about 80 ft. in depth, of which is a very fine grit, one half being white and the remainder a cream tint; the other is a strong coarse grit. The thickest beds obtainable are from 12 to 15 ft. Lower estuarine sandstones have also been quarried at Haw End, near Leathlum Bridge; whilst the limestones from Rosedale are of exceptional quality.

#### GENERAL BUILDING NEWS.

**PUBLIC BATHS, SHREWSBURY.**—New public baths, which have been erected in the Quarry at a cost of over 7,000*l.*, have just been opened at Shrewsbury. The baths have been built by Mr. H. J. Rimer, of Shrewsbury, from plans prepared by the borough Surveyor (Mr. W. C. Eddowes). The baths comprise a central dome and two wings, and include a house for the superintendent. They are built of

red pressed bricks, with copings and string-courses of Ruabon bricks and stone facings. Inside, to the right of the ticket-office, are the first-class plunge (or swimming) bath and private slipper-baths. The plunge-bath is 60 ft. long by 30 ft. wide, has an estimated capacity of about 53,000 gallons, and slopes from a depth of 3 ft. 3 in. at one end to 6 ft. 6 in. at the other. There are 31 dressing-boxes to the bath. The second-class plunge-bath forms the wing to the left of the main entrance, and is 82 ft. 6 in. by 32 ft. 6 in. It has a similar depth of slope and an estimated capacity of 82,000 gallons. In this bath there are no dressing-boxes, but there are spaces the length of each side of the bath partitioned off for dressing purposes. There is also a shower-bath and a soap-bath, and an attendant's office is attached to each bath. In addition to the above there have been provided a number of private slipper-baths, and these are placed beneath the dome in the central portion of the building and midway between the large baths. Of the first-class slipper-baths, two each are provided for ladies and gentlemen, these being supplied with dressing and waiting rooms and other necessities. A steam-laundry is situated at one end of the buildings. The swimming-baths are lined with white glazed bricks, and are lighted from the roof. Special exits are provided in case of fire, and if deemed necessary hereafter a gallery can be erected over the dressing-boxes in both swimming-baths. Additional slipper and Turkish baths can also be provided if required. During the day the baths will be lighted from the lantern-lights in the roof, and at night by gas. The glazing, painting, and other decorative work has been carried out by Mr. R. France, while Messrs. Scull did the plumbing work. The engineering work was carried out by Messrs. Thomas Bradford & Co., of Manchester and Liverpool, under the superintendence of Mr. Eddowes and Messrs. Bradford's engineer. This firm also fitted up the steam-laundry.

**NEW SCHOOLS, TOTTENHAM.**—The Tottenham School Board have commenced another large school near the Alexandra Palace, in the Bounds Green-road. The contract has been let to Mr. Charles Wall, of Chelsea, at 14,800*l.*, and the plans have been prepared by Mr. E. H. Lingens-Barker, architect, of London.

**BOARD SCHOOLS, BROCKLEY.**—New Board Schools were opened at Brockley on the 23rd ult. by Mr. J. R. Diggle, the Chairman of the London School Board. The school buildings occupy about an acre and a half of ground, and have been built at a total cost of 15,700*l.* The schools consist of two large one-storied buildings: the larger for boys and girls, the smaller for infants, with open playgrounds. Passing through the portals of the girls' entrance and approaching the main building, the corridor is passed, with a girls' cloak-room to the right, and the large class-rooms on the left. The central hall is 87 ft. by 26 ft. The roof is of glass and screens, drawn underneath the dome portion of the roof, temper the sun's rays when necessary. On the left there is another class-room, flanked by a boys' cloak room; and again succeeded by other two rooms; the same as obtain on the adjacent side of the hall, at the top of which is an erected platform. Two high, airy stairs, right and left, lead to the teachers' rooms, under which are other boys' and girls' cloak-rooms for the different standards. Adjoining the mixed school is the boys' playground. Each of the class-rooms in the main building is 25 ft. by 26 ft., and 15 ft. high. The infants school has a hall 57 ft. by 32 ft. with class-rooms on the right, lavatories, and cloak-rooms on the left. It has red brick walls, blue brick roofs, and low slated roofs. The inside has a plain glaze dado 4 ft. high, and is finished above with Medway galls, bricks being afterwards discoloured. The floors are laid with pitch pine wood blocks, the class-rooms having stepped platforms for the desks. The wood-work, generally, is stained and varnished. Lavatories are provided for each department. The heating is carried out on the one pipe low-pressure system with radiators in each room. Covered-in playgrounds are provided, in case of wet weather, for each department. The accommodation is for 800 children at present, with a provision for an enlargement of six class-rooms, which will bring the accommodation up to 1,200. The playgrounds are tar-paved; and the drainage, carried for three-quarters of a mile, is laid with best London pipes, joined with cement, and laid to stand the water test for twenty-four hours before being filled. The design of the buildings is by the Board's Architect, Mr. Bailey, the cost of the buildings being 13,000*l.*, of which the cost of the erection of the buildings being 13,000*l.*. The heating has been carried out under the Board's Engineer, Mr. Millington, by Messrs. J. C. & J. L. Ellis, of London. The whole work of the erection of the schools has been under the superintendence of Mr. G. Wilson, the Board's clerk of works.

**CATHOLIC CHURCH, DORKING.**—The foundation stone of the new Roman Catholic Church about to be erected in Falkland-grove, Dorking, was laid on the 17th ult. The character of the new church will be Early Gothic, and the building will provide accommodation for about 400 worshippers. For the present it will remain in an incomplete state until the necessary funds are forthcoming. The

present plans show the nave, one aisle and sanctuary; the tower and second aisle will be added at some future period. Messrs. Longley, of Crawley have contracted to erect the building as at present designed for a sum of 5,700*l.* Mr. F. A. Walters, F.S.A., of Croydon and London, is the architect.

**SHERIFF COURT HOUSE, KIRKCALDY.**—On the 21st ult. the building which has been erected for the new Sheriff Court-House, Kirkcaldy, and which stands at the north-east corner of Whytehouse Grounds, was opened. The designing of the building was entrusted to Mr. Gillespie, architect, St. Andrews. The architecture is chiefly of the Scottish Baronial type. The elevation towards Wemyssfield shows the entrance doorway in a massive central block, which in the third story terminates in a balcony with balustrade. At the angle of this block is a tower, circular below, and of octagon shape in the upper stages, reaching about 70 ft. in height to the apex of a conical top, and ornamented with bands, moldings, shields, &c. Next to the tower the most conspicuous feature are three windows, with double transoms, lighting the hall or court-room, an apartment about 40 ft. long by 20 ft. in width, with a high-pitched roof. The Sheriff's private room, jury-room, and witnesses' room are connected with the court-room, and contain all the modern conveniences, and the keeper's house is situated at the rear of the building. The contractors were:—Messrs. George Smith & Sons, Kirkcaldy, builders; Mr. Thomas Harris, St. Andrews, joiner; Mr. Alex. Ferguson, Kirkcaldy, slater; Mr. Robert McGregor, Dunfermline, plasterer; Messrs. Robert Frew & Sons, Perth and Kirkcaldy, plumbers; Mr. Frank Ritchie, Kirkcaldy, smith; Messrs. W. Bryden & Sons, Edinburgh, bellhangers; Mr. Hay, Newburgh, painter.

**RESTORATION OF CHURCH, LINTHWAITE, YORKSHIRE.**—On the 26th ult. the corner-stone of a new chancel for Christ Church, Lintwhaite, was laid by Mrs. William Brooke, of Northgate Mount, Honley. The church was built in 1826, and was opened in 1828. It has remained up to the present time without a chancel. The one now to be added will, measured from the inside, be 25 ft. long, 18 ft. wide, and 22 ft. high, and will be built in conformity with the present structure, of ashlar-stone from the local quarries on Crosland Hill. The window at present at the east end of the church will be reduced in size and utilised for the chancel window, but the painted glass will be replaced by cathedral-tinted glass. In addition to the erection of the chancel, various improvements will be effected in the church. The gallery will be reduced in size, and the body of the church will be re-seated with open seats of red deal. A new floor of concrete wooden blocks will be put down, and there will be new choir stalls and pulpit of oak. The present porch on the south side will be made into a baptistry, and the entrance in future be by the west tower. A new organ will also be provided. Mr. C. Hodgson Fowler, of Durham, is the architect, and the following are the contractors:—Mr. John Walker, Lintwhaite, mason; Messrs. Wood Bros., Huddersfield, joiners; Messrs. W. & P. Holroyd, Huddersfield, painters; Mr. E. Sykes, Milnsbridge, plumber; and Messrs. Johnson & Sons, Mirfield, plasterers and slaters. It is estimated that the total cost will be about 2,500*l.*

**VOLUNTEER DRILL HALL AT HARRGATE.**—The memorial stone was recently laid of a drill-hall which is being erected in Franklin-road, Harrogate. The length of the drill-hall proper, irrespective of the entrance, is 91 ft. long by 43 ft. wide. The building includes armoury, rearing-rooms, and lavatories on the ground-floor, whilst on the second story are three rooms available for officers, sergeants, and men. The structure is fronted by an ornamental tower, which is large enough for the accommodation of the sergeant-instructor and his family, who will reside on the premises. The drill-hall is estimated to cost 2,000*l.* The building is being erected to designs and plans prepared by Messrs. H. E. and A. Brown, architects, Harrogate, whilst the contractors are as follows:—Masons' work, Mr. Anthony Brown; plumbers' work, Mr. W. Bellerby; joiners' work, Messrs. Michell & Carrick; slater, Mr. W. Baynes; plasterer, Mr. C. Fortune; painter, Mr. J. R. Petty.

**NEW BOARD SCHOOLS IN PLYMOUTH AND DEVONPORT.**—The North-road School, a tender for which has just been accepted by the Plymouth School Board, will be erected at the western end of Boon's-place, and will have a frontage in North-road, 105 ft. in length. It will accommodate 780 children, and will have, in addition, two central halls. The building externally will, on all sides, be of Plymouth limestone, with Portland stone and Ham-hill stone dressings, and will be in the Elizabethan style treated simply, but with some regard to the prominence of the site. The Ford School, to be built by Messrs. A. R. Lethbridge & Son, on a site secured by the Devonport School Board, is for 540 girls and infants, and will also contain two large central halls, which, with the classrooms on each side of the hall on both floors will be heated by hot water. The walls will be of brick on limestone plinths. There will be covered as well as open playgrounds. Both of these schools will be built from the designs, and under the direction of, Messrs. Hime & Odgers, architects.

\* Quart. Jour. Geological Society, vol. xxxviii, p. 16.



**ELECTRIC SUPPLY STATION, HAMSTEAD.**—The ceremony of laying the foundation or commemorative stone of the new Central Electric Supply Station for the Vestry of St. John, Hampstead, has just been performed by Mr. James Thwaites, Chairman of the Electric Lighting Committee. A silver trowel was presented to the Chairman by Messrs. Yerbury & Sons, the builders, and a mallet to the architect. The buildings, which are nearly complete, have been built in stock bricks and red brick facings, &c. The chimney-shaft, 140 ft. high, is 16 ft. square at the base and 12 ft. square at the springing of cap; it is faced with picked stocks and red brick pilasters and dressings, relieved with plain bands of grey Luton bricks. The stone for cornice and cap was supplied by the Bow-stone Company, of Maldstone. The shaft is built of sufficient size to meet the requirements of the complete station, only one-half of which has for the present been erected. Mr. Arthur Ardron is the architect.

**CAKE FACTORY, CARDIFF.**—This building, which has just been completed for the Dulcia Cake Company, is situated in the Penarth-road. The softness of the site, which backs on to the Taff River, necessitated deep holes being dug all over it, and these were filled with concrete. The main building is 75 ft. by 40 ft. and contains three floors, the mixing-room, bakehouse, and chief office being on the ground-floor. The second floor is used as a packing room and has lavatories and water-closets, and another office, while a general store-room occupies the second floor. One of Messrs. T. Thomas & Sons' (of Cardiff) patent "Acme" hoists connects all the floors. The mixing machinery, which is driven by means of shafting connected with a Tangey's gas-engine, was supplied and fixed by Messrs. Baker & Sons, of London; the cake-ovens were built by Messrs. A. Hunt, of Leicester, and George Davies, of Abergavenny; and the ironwork for the floors was supplied by Mr. A. D. Dawney, of London and Cardiff. The building, of which Messrs. Veall & Sant, of Cardiff, were the architects, is entirely erected of brickwork, with Forest Dean stone sills and keystones, and the carving was carried out by Mr. W. H. Wormleighton, of Cardiff. The contract has been executed by Messrs. Knox & Wells, of Cardiff.

**CLOCK TOWER, COURT HOUSE, SHILLELAGH.**—Earl Fitzwilliam is about to add a clock tower to the Court House at Shillelagh, from designs by Mr. G. Hamilton Gordon, of London. The clock has been presented to him by his Irish tenants, in commemoration of the coming of age of his grandson and heir, Viscount Milton.

#### SANITARY AND ENGINEERING NEWS.

**AN ESTATE WATER SUPPLY.**—There has just been completed a scheme for the supply of water to the mansion-houses of Halleaths and Broadholm, Lochmaben, and Dryfeholm, Lockerbie, besides the various farmhouses and cottages on the estates. Hitherto the only supply available has been from wells and springs, the quality of the water from which could not always be relied on. A burn running through the farm of Thornhillwaite was fixed upon, and on being gauged was found to meet all the requirements. A reservoir was built about 500 ft. above sea-level, and capable of holding 200,000 gals. From this the water passes through a filter bed into a clear-water tank with a capacity of 38,000 gals., and is then distributed through nearly eight miles of piping. The whole scheme, which will cost over 2,000l., has been carried through at the instance of Sir Robert Jardine, Bart., of Castlemilk, and Mr. A. J. S. Johnstone, of Halleaths. Mr. A. Chapman, surveyor on Castlemilk estate, was the engineer of the scheme.

**NEW RAILWAY TO HARROW-ON-THE-HILL.**—The Unopposed Bill Committee of the House of Commons passed, on Tuesday, a Bill authorising the incorporation of the company for the purpose of constructing a railway commencing by a junction with the Metropolitan District Railway at Ealing and terminating at Harrow-on-Hill. The share and loan capital authorised by the Bill is 160,000l.

**WATERWORKS, BALLYCASTLE, NEAR BELFAST.**—On the 21st ult., the new waterworks which have been constructed at Ballycastle were opened by Miss McGildowney. The supply of water to Ballycastle is obtained from two springs situated on the western slope of Knocklayde. The elevation is about 770 ft. above sea level, and about two miles distant from Ballycastle. The water is intercepted by means of two collecting tanks, built of concrete and provided with overflows. The water is then conducted by means of a line of 3-in. cast-iron pipes, for about one mile, into a pressure tank, which is also built of concrete, and provided with an overflow and a valve for regulating the supply to Ballycastle. This tank is about 450 ft. over sea level, and is at a sufficient height to deliver water at a high pressure to the most elevated parts of the town. A line of 4-in. pipes is laid from the pressure tank down the mountain slope, across the railway, and into Ballycastle for town supply. The water is then distributed along the different streets and down to the quay. These pipe-lines are sup-

plied with the necessary valves, fire hydrants, and fountains. There are about 4,750 yards of 4-in. pipes, and about 3,250 yards of 3-in. pipes. The total cost of the works is 1,028l. The engineer for the scheme was Mr. L. L. Macassey, of Belfast, the works being carried out by Messrs. Boyle & Clyde, contractors, Ballymena and Ballycastle. The valves, fire hydrants, and fountains were supplied by the Glenfield Company, Limited, Kilmarnock, and the pipes were furnished by Messrs. D. & G. Stewart & Co., Glasgow.

#### STAINED GLASS AND DECORATION.

**WINDOW, MARY TAVY CHURCH, DRAON.**—Stained glass has been inserted in the east window of this church. The window is a three-light Perpendicular one, the stonework of which has been restored by Mr. Edmund Sedding. The subject illustrated runs through all the lights, and is under canopies of the period. It depicts a vision of Our Lord in Glory, surrounded by kings, bishops, men and women, indicating all states of the Church triumphant. Above the head of Our Lord is held a crown, supported by two flying angels. The donor is the Rev. J. K. Anderson, Vicar of the church. The window was executed by Messrs. Percy Bacon & Brothers, of London, under the direction of the architect.

#### FOREIGN AND COLONIAL.

**FRANCE.**—The jury of the competition for the construction of a group of schools at Montrouge have selected the design of MM. Dupont and Albert Guibert for execution, and given a first premium to M. Courtois-Suffit and a second to M. Trinquesse. On Sunday last the new bridge over the Marne at Bonneuil was officially opened.

At Paris, in the XIIIth Arrondissement, the foundation has just been laid for a new church, that of "Sainte-Anne de la Maison Blanche." The railway company "de l'Ouest" is about to erect a new and important terminal station at St. Cloud, to be reached by a large bridge over the low-level streets. A large granite staircase will also lead up to it from the Place de l'Hospice, at the entry of the Parc de Montrouge, and will also serve to connect the upper and lower town. A line from Trilport to Ferte Milon is to be opened on July 1. The municipality of Marseilles has opened a competition for the construction of a building for the Faculté des Sciences. The museum at Bernay (Eure) has just received, as an addition to its treasures, a fine portrait attributed to Alonso Cano.

At Lyons there has been inaugurated a marble statue, the work of M. Aubert, to the memory of Bernard de Jussieu. The great octagon fêche of stone, 60 metres high, which crowns the church of Notre Dame de Bon Secours at Guingamp, is about to be repaired and restored. The church is a curious monument of twelfth-century architecture. It is also proposed to rebuild the hexagonal tower of Romanesque date adjoining the cathedral-church of St. André at Gap. New barracks are in course of erection at Brest, on the site of the old fort "des Fédérés." The Ministry of War has definitely approved of the demolition of the fortifications of Vitry. A large project is under discussion for diverting all the water of the Douance river, below St. Martin de Gueyrières, by means of an immense "barrage," and leading it in a tunnel to a point above the village of Bessée in order to create a fall more than 80 metres in height, which will serve as a motive power for electricity. M. Nonjean, an artist who had made a speciality of little landscapes in terra-cotta, finished with great minuteness, has died at Arras. Last Saturday, at the Champs Elysées Salon, the vote was given for the "médaillés d'honneur," which in architecture was awarded to M. Georges Chédanne for his study of the Pantheon at Rome. Of the other architects "in the running," M. Hannott had seven votes; M. Coqart two, and MM. Doumic and Parent one each. M. Chédanne was born at Maromme in 1860, and obtained the Prix de Rome in 1887. The facade of the Pantheon at Paris has for some days disappeared behind scaffolding, which has been raised for the repair and restoration where necessary of the pediment sculpture by David d'Angers. No repair has been made since 1844 to the exterior of the building, which bears traces of the civil wars and of the bombardments of 1871.

**PUBLIC WORKS IN THE CANARY ISLANDS.**—According to a recent report of the British Consul at Tenerife upon the trade and sanitary condition of the Canary Islands, both in Grand Canary and Tenerife progress in road-making continues. An improvement in the water supply of houses and buildings is to be made by substituting iron for stone pipes. The latter, in the upper part of the town, are frequently broken, and sewage gets into them, contaminating the water—of excellent quality—from springs in the mountains. Lighting the town of Santa Cruz, in the Island of Palma, by electricity has proved a success, and is being adopted, and it will probably be adopted at once at Orotava, Tenerife. The Taoro Grand Hotel has been fitted with the necessary wires, lamps, &c.

#### MISCELLANEOUS.

**THE SURVEYORS' INSTITUTION.**—The annual general meeting of the Surveyors' Institution was held on the 28th ult. at the Rooms, 23, Great George-street, Mr. C. J. Shoppee, President, occupying the chair. The report, read by the secretary, Mr. Julian C. Rogers, stated that the past year had been almost exclusively devoted to the work of consolidation. The Institution continued to prosper in every respect, and there had been no slackening in the efforts of the Council to promote its usefulness. The statement of accounts showed that the financial position was in a very flourishing condition, and liabilities at the present time did not exceed 1500l. The total investments, estimated at present prices, represented a sum of 27,358l., which did not include premises, furniture, and valuable library. The report and accounts were adopted, and at the conclusion of the formal business the President presented to the successful candidates the prizes won by them in connexion with their recent professional examinations. A vote of thanks was passed to Mr. Shoppee, the retiring President, and the proceedings shortly afterwards terminated. Mr. T. Chaffield Clarke, who during the afternoon was elected President, took the chair in the evening at the annual dinner of the Institution, held at the Holborn Restaurant. The usual loyal and patriotic toasts having been honoured, Mr. D. Watney proposed "The Houses of Lords and Commons," and the Duke of Devonshire replied for the House of Lords and Mr. Jesse Collings, M.P., replied for the House of Commons. Mr. Watney proposed "The Surveyors' Institution," and the Chairman, in reply, congratulated the members on the progress the society had made. He urged them not to forget that the interests of the Institution were bound up with those of the surveyors throughout the country, and said the society had no object but that of raising the status of the profession. Other toasts followed, and on behalf of the members, the Chairman presented the Secretary, Mr. J. C. Rogers, with a service of plate and a purse of 400 sovereigns in recognition of his long services.

**TRAVELLING GREENHOUSES.**—The "Horticultural Travelling Structures Co." send us a description and illustration of their system of glass houses or plant protectors constructed to run on rails, with heating apparatus to move with them required. The inventors claim that this will ensure a succession of forced crops to be produced, without the manual labour of shifting the plants or the soil. The labour of watering can often be saved by moving the structure off the crop during rainfall. The system seems worth attention, though of course the necessity for the laying down of rails must mean that the ground must be laid out and planned specially for its working.

**DAMPIER'S INTERCEPTOR AND INSPECTION SHAFT.**—This is an interceptor with a manhole inspection shaft made in glazed stoneware in two, three, or more socketed lengths as required, so that the manhole becomes part of the whole structure instead of being built separately in brickwork. There are some advantages in this, in regard to completeness of fitting and workmanship. Moreover, as the patentee (Mr. R. F. Dampier, Stoke, Devonport) observes, the stoneware will not get impregnated with sewer emanations as brickwork does.

**ANCIENT ALTAR SLAB, ABERGAVENNY.**—During alterations at the premises known as the "Grove" (formerly an inn), at Abergavenny, where pavement had been stripped from the chimney base, just over a large slab of stone was exposed to view. Near one of the corners of the slab was a small cross roughly cut into the stone. Mr. Gardner, an archaeologist, examined the slab and found that it measured 7 ft. 6 in. in length, 2 ft. 8 in. in width, and 5 in. in thickness. This, combined with the fact that at each corner of the slab and near the middle of it there were small crosses similar to that which had at first attracted attention, convinced him that here he had one of a few ancient altar-stones which had escaped destruction at the hand of Cromwell and his followers. The small crosses at the corners represent the nail wounds in the hands and feet of the crucified Saviour, the cross near the middle the spear wound in his side. The dressing of the slab is in the style of a workman's, over a rougher dressing of an earlier date. Mr. Gardner presented the relic to the vicar of Holy Trinity and the churchwardens. It stands on an oak table with panelled front, mounted by a re-table, affording a view of the man on the furthestmost side of the slab.—*Herald Times.*

**ROMAN REMAINS AT ROCHESTER.**—Some archaeological discoveries have recently been made at Rochester, which are held by antiquaries to throw a new light upon the history of the city and upon the plan of its ancient defences. The pick and spade investigations, carried out under the superintendence of Mr. George Payne, F.S.A., secretary of the Kent Archaeological Society, have revealed the fact that the Romans walled in Rochester at the time the city formed one of their stations. The course of this wall, which reduced the city to a small area, has been disclosed by the discovery of the works on Rochester hitherto, has been the underground from point to point. Beneath Dean Hole's lawn the masonry is 7 ft. thick.



The front of the ancient Bishop's Palace was built upon the old Roman wall. Some of the public streets also pass over this wall, which altogether enclosed an area of 235 acres. It is now established that Rochester has been walled in at different periods, and remains of all three walls—Roman, Norman, and Henry III.—are in existence. On each occasion that new walls were built the boundaries of the city were apparently extended. An important feature in the discoveries just made is the fact that the old Roman wall recently found is in a direct line with the base of the castle wall overlooking the river, which corroborates the theory that has been held for centuries by archaeologists, that the Castle wall is built upon Roman foundations. Another point established is that the relics of ancient walls remaining above ground, and the date of which has been classed as "doubtful" hitherto, are in reality Roman, and correspond in every particular with the wall which has been proved to be beneath modern Rochester. These relics are described as some of the finest ruins of Roman wall to be found anywhere in England."—*Southport Visitor*.

**ANCIENT CARVED OAK DOORS SOLD AS LUMBER.**—A Stratford-on-Avon correspondent states that the inhabitants of that place are indignant at a matter that has just come to light. One of the churchwardens, new to his duties, has sold as lumber the ancient carved oak and panelled doors of the north porch of the parish church celebrated as the burial-place of Shakespeare. The vicar and the other churchwarden knew nothing of the matter until the bargain was completed. The doors were put up a century before Shakespeare's time, and recently they were temporarily removed to disclose some old carving and a peculiar holy water mark in the porch. The doors weigh half a ton, and are in perfect condition. It is stated that the purchaser meant to use them in the construction of a pig-sty; but during their removal inquiries were set on foot, and now the purchaser is being implored to restore the doors, but he is anxious to make a profit out of the transaction. It is contended that the doors form part of the church fabric, and were connected with the building, and that only after obtaining a faculty from the Bishop could they be disposed of.

**SALE OF THE ALBERT PALACE.**—Messrs. Horne, son, & Eversfield sold, on the 29th ult., in lots, the Albert Palace and Connaught Hall, Battersea. The site of the Palace was not put up for auction, having already been sublet by the Office of Works for building of large tenements. The marble columns taken from Baron Grant's house in Kensington, and the stonework taken from the old Law Courts, besides the Picture Gallery and the dining-room, were sold before the auction by private contract. Lot 1, composed of all the glazed roof, fetched 11. 5s., and prices ranged about the same average. Lot 14, the ironwork of the East Annex, which comprised three cast-iron gutters, ten principal and fifteen columns, fetched 18. The bidding was confined to a comparatively small number of builders and dealers in this kind of material.

**THE RICHMOND OLD DEER PARK.**—A meeting was held on Tuesday at Richmond Theatre, with a view to considering a proposal that the Richmond Town Council should acquire the Old Deer Park on the Crown. The meeting was called by the Mayor, Alderman Slumper, on a requisition of 100 signatures. Councillor Thompson explained the details of the proposal, which included the devoting of seven acres to a free playground for school children of Richmond, seven acres to allotments, and the making of a footpath across from Richmond to the new foot-bridge. Councillor Thompson said that he had the authority of a committee of local gentlemen to say that they would be willing to guarantee the town council against loss by paying for the park, after the deduction of the footpath and the fourteen acres, as much as they paid for the whole. The following resolution was carried unanimously: "That in view of the great importance of the Richmond Old Deer Park as an open space and public pleasure ground, this town's setting of burgesses of Richmond respectfully urges the Chief Commissioner of Woods and Forests to facilitate in every possible manner the hiring of the park by the Corporation of Richmond on the most favourable terms, so as to enable the masses of the people of Richmond to derive the most possible advantage therefrom."

**COMMISSION OF SEWERS.**—On the 24th ult., an inquest was held at the Cannon-street Hotel, which was given by the Commission of Sewers to meet the Lord Mayor and Sheriffs, and to do honour to the late Chairman, Mr. H. H. Bridgman, F.R.I.B.A., whose chair was taken by Alderman Bell, F.R.G.S., and was supported on his right by the Lord Mayor, and on his left by the Lord Mayor's clerk. The longest other toasts proposed was "The Health of the Past Chairman," which was given by the chairman of the evening, who said that Mr. Bridgman had been a prominent member of the Corporation, and had taken a leading part in many important debates. It was usual for the eulogies of the chairman on his retirement to be accompanied with some recognition of their approval of his past services, and the honour of making presentation to Mr. Bridgman that evening had

been placed in his hands. A full-sized portrait in oils of Mr. Bridgman, painted by Mr. Manton, was then unveiled, and the chairman said that on behalf of his colleagues and himself he had very great pleasure in presenting it to Mr. Bridgman. Mr. Bridgman acknowledged the compliment that had been paid him.

**ROMAN ROADS IN DUMFRIESSHIRE.**—At the concluding meeting of the present session of the Society of Antiquaries, held in Edinburgh on the 21st ult., Dr. James Macdonald discussed the so-called Roman roads in Dumfriesshire in continuation of his general examination of the existing evidence for the authenticity of the various Roman roads in Scotland as laid down in the Ordnance Survey maps. The Dumfriesshire "Roman roads," of which only portions here and there can be pointed out, and of whose exact courses no two authorities are agreed, may be regarded as forming four sections—(1) the Lower Annandale, (2) the Upper Annandale, (3) the Nithsdale, and (4) the Cairn Valley roads. These he described and discussed in detail, showing how the belief that they were Roman arose in the last century, chiefly founded upon certain theories of the leading antiquaries of the time as to the movements of the Roman troops and the existence of so-called Roman camps or stations on the supposed lines of march or communication. But the deductions had to be received with caution, and, before accepting the conclusion that all the roads that were thus theoretically assigned to the Roman military occupation were really of that time and origin, it was necessary not only to sift the literary evidence thoroughly, but to see what evidence could be obtained from the actual construction and characteristics of the roads and camps themselves.

**FATAL ACCIDENT IN NORTON FOLGATE.**—On Saturday last Mr. A. Hodgkinson held an inquest on the body of H. Pluck, who had been killed by the fall of a floor in Elder-street, Norton Folgate, on the 21st ult. Mr. Henry Lovegrove, District Surveyor of South Islington, Shoreditch, and Norton Folgate, produced a plan of the premises and stated that some alterations had been made in the floor over a stable (he was informed about six years since), throwing the weight of a girder on two bearers to in. deep by 5 in. wide. One of the bearers had two saw-cuts in it, and both were in the first stage of decay. He considered that a sound piece of timber would not have broken with two or three times the weight of the girder placed upon it, but he thought the construction bad. Mr. W. E. E. F.S.I., architect to the owners, attended. Three men and thirteen horses were buried; one man was killed and two shaken; the whole of the horses were uninjured. Verdict—Accidental death.

## LEGAL.

## STRAND SUBSIDIENCE CASE.

In the Chancery Division on the 25th ult., Mr. Warrington, Q.C., mentioned the case of the Strand Board of Works v. Annan and others to Mr. Justice Kekewich.

The learned counsel stated that the case, which involved a very serious question, related to large building operations on the west side of a small street running from the Strand to the Embankment, called Carting-lane, and the plaintiffs alleged that by reason of the excavations carried on by the defendants, who were excavating some 24 ft. to 40 ft. below the level of some parts of the lane, there had been a most extensive subsidence, in consequence of which the fire water-main protecting the Savoy Theatre had been burst. He suggested to his learned friend, Mr. Renshaw, Q.C., who represented the defendants, that their two surveyors should meet, and with the assistance of a third, to be appointed by his Lordship, and without prejudice to any questions which might possibly arise hereafter, inspect the property and order what work should be found necessary for the protection of the surrounding property, to be executed.

Mr. Renshaw, Q.C., on behalf of the defendants, consented to the suggestion of his learned friend, and remarked that his clients were every hour strengthening the supports, as they had finished the excavations and were then building up the concrete. His Lordship acted on the suggestion of the learned counsel, and appointed Mr. Harris to act as the third surveyor.

## CAPITAL AND LABOUR.

**THE DISPUTE IN THE SOUTHPORT BUILDING TRADE.**—The 130 bricklayers' labourers who recently went on strike in Southport for an advance to 6d. an hour, are returning to work at 6d. an hour, instead of 5d. generally, and 6d. in a few places, which obtained before.

## MEETINGS.

SATURDAY, JUNE 2.

**Architectural Association.**—First Summer Visit, to the Houses of Parliament and Westminster Abbey. Incorporated Association of Municipal and County Engineers.—Western Counties' District Meeting, to be held at Torquay.

**Northern Architectural Association.**—Outdoor Meeting at the Rutherford College, Newcastle, at 3 p.m.  
**Edinburgh Architectural Association.**—Annual Excursion, to Culross and District.  
**Queen's College, Cork.**—Mr. Arthur Hill on "The History of Architecture." XX. 3 p.m.

MONDAY, JUNE 4.

**Society of Engineers.**—Mr. Ed. C. de Segundo on "Power Distribution by Electricity, Water, and Gas." 7.30 p.m.

TUESDAY, JUNE 5.

**Society of Engineers.**—Visit to the South Metropolitan Gas Works, Old Kent-road, S.E.  
**Society of Biblical Archaeology.**—8 p.m.

WEDNESDAY, JUNE 6.

**British Archaeological Association.**—(1) Mr. C. H. Compton on "Kirkham Priory and Walden Abbey." (2) Mr. F. H. Williams on "The Discovery of a Roman Building at Chester." (3) Mr. Andrew Oliver on "Monumental Brasses." 8 p.m.  
**Builders' Foremen and Clerks of Works' Institution.**—Ordinary meeting of the Members. 8.30 p.m.

THURSDAY, JUNE 7.

**Society of Antiquaries.**—8.30 p.m.  
**Royal Institution.**—Mr. W. M. Flinders Petrie on "Egyptian Decorative Art." III. 3 p.m.

FRIDAY, JUNE 8.

**Royal Institution.**—Mr. C. Vernon Boys on "The Newtonian Constant of Gravitation." 9 p.m.

## RECENT PATENTS:

## ABSTRACTS OF SPECIFICATIONS.

8,643.—**INTERCEPTORS FOR SEWERS AND DRAINS:** W. Sykes. To dispense with the complicated arrangements in general use a ventilator, invert to manhole ventilators to drains and sewers are all combined in one piece. The appliance is made in stoneware, concrete, or iron.

9,542.—**WATER-CLOSETS:** J. Day.—According to this invention, special design and construction is arranged so as to prevent scrubbing-brushes, tin canisters, and such like articles from passing through the bottom of the pan, to ensure that the pan will be cleaned by the flow of water used for flushing the closet, and to facilitate the clearing or unstopping of the drain when necessary. The means to these ends are set forth in a lengthy specification.

10,103.—**PLASTER BOARD FOR WALLS AND CEILINGS:** J. D. Baker and another.—The plaster board is formed of a plaster facing and backing, having a sunken face between two of its edges and strips of textile fabric secured in its other two edges between the backing and facing and adapted to lie in the sunken faces of boards, which are secured together by a suitable plaster filling.

11,325.—**REVERSIBLE SASH:** J. Lowmiller.—The sashes are hung without weights, the cord passing over a pulley and being attached to each sash separately. The removal of a small tongue-piece allows the sashes to be turned inwards for cleaning.

12,023.—**PAINT MIXERS:** J. H. Hind.—In paint-mixing machines an inner and an outer set of vertically arranged blades are caused to rotate in opposite directions within the interior of a pan, and slotted ears or lugs are provided to allow the blades and mechanism to be easily withdrawn.

12,639.—**CHANNEL BLOCKS, &c.:** F. A. Green.—These blocks, which are to be used as reducing couplings to drain pipes, &c., and for similar purposes, are made in one piece of earthenware, and channels are made at the sides of the blocks, to be utilised for various purposes.

13,759.—**WINDOW-SASHES:** J. Hay.—The windows are made in the ordinary way, but with retaining strips, which are removed when the windows to be reversed for cleaning or other purposes.

15,507.—**RAISING SASHES, &c.:** W. Giblin.—The frame is made of solid lead, and the sash is rebated, and has a metal cogged bar, by which the sash is raised and lowered, a bevel-gidged wheel works in the cogged bar to work the sash without cords or weights.

## NEW APPLICATIONS FOR LETTERS PATENT.

MAY 15.—9,506, C. Newton, Saw-grinding Machines.—9,507, D. Morgan, Flushing Stench-traps, &c., principally applicable to Water-closets and Sinks.—9,517, M. Tibbitts, Draught Crestor and Gas-lamp combined for Ventilating Sewer-shafts.—9,519, T. Cosham, Filtering Beds.—9,521, J. Childs, Revolving Cows for Chimneys and Ventilating shafts.—9,545, A. Banchier, Continuous or Running Kilns for Burning Lime, Cement, &c.—9,546, H. Hoddin, Kilns.

MAY 16.—9,552, J. Penwill, Drain Trap.—9,556, R. Robson, Down-draught Preventer for Chimneys.—9,564, T. Robinson, Connecting Metal Pipes to Earthenware Drain-pipes, Water-closet Basins, or Traps.

MAY 17.—9,655, J. MacArthur, White Lead.—9,662, Schmeil and P. Saar, Skylights.—9,684, J. F. Foot, Window-sashes.—9,701, P. Knobel, Angle or Square.

MAY 18.—9,735, A. Boulton, Ventilators or Blowers.—9,745, G. Garrad, Tiles.—9,756, C. Waddell, Operating and Automatically Locking Sash-windows.

MAY 19.—9,773, T. Atkins, Water Waste-preventer Cisterns.—9,774, W. Young, Hanging Window-sashes.—9,784, J. Jackson, Window-sashes.

## PROVISIONAL SPECIFICATIONS ACCEPTED.

6,772—A. Hunter, Window Lock.—7,411, G. Copping, Scaffolding.—7,415, W. and T. Fox, Joiners' or other Crank Braces with Loose Head and Handle.—7,776, C. Chalks, Gratings or Strainers for Sinks, Drains, &c.—8,810, G. Kinnell, Actuating Ventilators.—7,840, G. Farini, Door-closers.—8,257, W. Ross, Jendr, Siphons for Water-closet and other Cisterns.—8,453, W. Connell, Regulating Fanlights and Skylights.—8,883, O. Curney, Screws.—8,910, J. Boulton, Ventilators.

## COMPLETE SPECIFICATIONS ACCEPTED.

(Open to Opposition for Two Months.)

12,065, C. Stockwell and P. Smith.—Siphon Tank for Flushing Water-closets.—7,248, F. Cobb and A. Oldham, Sash Fasteners.



## CONTRACTS—Continued.

[illegible]

*Public Appointments, p. xx. and xxiii.*

## ESTATE EXCHANGE REPORT.

MAY 23 — Holton, Richards, & Co., Block of  
artisans' dwellings, "White Horse Alley," West Smith-  
field, ut. 62 yrs. gr. 30d., 300l.—By Daniel Smith, son,  
s. *velly*, i.s. to c. 60d.; ut. 95 yrs. even Albany, Old  
Borough, s. *velly*, i.s. to c. 60d.; ut. 95 yrs. even  
58 to 70 years, Bagshot-rd., fr. r. 1702l. to 66 6d., and  
i.g.r. of 212l. 2s., Elmore-st., Almorah-rd., and  
Charles-st., Islington, ut. 58 yrs. gr. 15d., 350l.—  
400l.; i.g.r. of 152l. 10s., Lyndhurst-rd., Peck-  
ham, fr. r. 380l. 40s.; 86 Ramsden-rd., Islington,  
355l.; i.g.r. of 60s., Ramsden-rd., reversion in 78 yrs., 130l.  
i.g.r. of 30d., Langdon-rd., Camberwell, ditto in 73 yrs.,  
400l.; i.g.r. of 30d., George-st., Gipsy Hill, ditto in 73 yrs.,  
400l.; i.g.r. of 152l. 10s., Elmour-rd., Islington,  
151. Woodland-rd., Norwood, ditto in 56 yrs., and the  
reversion in 57, Woodland-rd., 360l.; i.g.r. of 40d., Elm-  
our-rd., Islington, reversion in 80 yrs., 350l.; i.g.r. of 14d. 8s.,  
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—By Ruthworth & Stevens: 15, 16, Cullum-st., City of  
London, fr. r. 385l. 6s., 17, Cullum-st., fr. r. 300l.  
every 14 No. 8 Corporation lease, New Bond-st., fr. 450l.  
every 14 No. 8 Corporation lease, New Bond-st., fr. 450l.  
350l. every 14 yrs., 3150l.; Corporation lease, 17, Stratford-  
rd., Oxford-st., r. 1260l., 3750l.; set of chambers, Hay  
Albany, Piccadilly, subject to fee farm rent, 351, and repay-

May 25.—B. *W. Mann* & *Son*: a King's-pl.  
Camen Town, Utah. 55 yrs. *gr.* *gr.* *261*.  
By *W. B. Hallett*: Nos. 18, 20, 22, Lambeth Walk, *ut.* *gr.*  
60, 62, 600, 691.—By *A. A. Hollingsworth*: 94, Clare-  
mont, Gladstone Gate, *ut.* *gr.* *18*, 169, 190; 1 to  
100, 101, 102, 103, 104, 105, 106, 107, 108, 109, 110, 111, 112, 113, 114, 115, 116, 117, 118, 119, 120, 121, 122, 123, 124, 125, 126, 127, 128, 129, 130, 131, 132, 133, 134, 135, 136, 137, 138, 139, 140, 141, 142, 143, 144, 145, 146, 147, 148, 149, 150, 151, 152, 153, 154, 155, 156, 157, 158, 159, 160, 161, 162, 163, 164, 165, 166, 167, 168, 169, 170, 171, 172, 173, 174, 175, 176, 177, 178, 179, 180, 181, 182, 183, 184, 185, 186, 187, 188, 189, 190, 191, 192, 193, 194, 195, 196, 197, 198, 199, 200, 201, 202, 203, 204, 205, 206, 207, 208, 209, 210, 211, 212, 213, 214, 215, 216, 217, 218, 219, 220, 221, 222, 223, 224, 225, 226, 227, 228, 229, 230, 231, 232, 233, 234, 235, 236, 237, 238, 239, 240, 241, 242, 243, 244, 245, 246, 247, 248, 249, 250, 251, 252, 253, 254, 255, 256, 257, 258, 259, 260, 261, 262, 263, 264, 265, 266, 267, 268, 269, 270, 271, 272, 273, 274, 275, 276, 277, 278, 279, 280, 281, 282, 283, 284, 285, 286, 287, 288, 289, 290, 291, 292, 293, 294, 295, 296, 297, 298, 299, 300, 301, 302, 303, 304, 305, 306, 307, 308, 309, 310, 311, 312, 313, 314, 315, 316, 317, 318, 319, 320, 321, 322, 323, 324, 325, 326, 327, 328, 329, 330, 331, 332, 333, 334, 335, 336, 337, 338, 339, 340, 341, 342, 343, 344, 345, 346, 347, 348, 349, 350, 351, 352, 353, 354, 355, 356, 357, 358, 359, 360, 361, 362, 363, 364, 365, 366, 367, 368, 369, 370, 371, 372, 373, 374, 375, 376, 377, 378, 379, 380, 381, 382, 383, 384, 385, 386, 387, 388, 389, 390, 391, 392, 393, 394, 395, 396, 397, 398, 399, 400, 401, 402, 403, 404, 405, 406, 407, 408, 409, 410, 411, 412, 413, 414, 415, 416, 417, 418, 419, 420, 421, 422, 423, 424, 425, 426, 427, 428, 429, 430, 431, 432, 433, 434, 435, 436, 437, 438, 439, 440, 441, 442, 443, 444, 445, 446, 447, 448, 449, 450, 451, 452, 453, 454, 455, 456, 457, 458, 459, 460, 461, 462, 463, 464, 465, 466, 467, 468, 469, 470, 471, 472, 473, 474, 475, 476, 477, 478, 479, 480, 481, 482, 483, 484, 485, 486, 487, 488, 489, 490, 491, 492, 493, 494, 495, 496, 497, 498, 499, 500, 501, 502, 503, 504, 505, 506, 507, 508, 509, 510, 511, 512, 513, 514, 515, 516, 517, 518, 519, 520, 521, 522, 523, 524, 525, 526, 527, 528, 529, 530, 531, 532, 533, 534, 535, 536, 537, 538, 539, 540, 541, 542, 543, 544, 545, 546, 547, 548, 549, 550, 551, 552, 553, 554, 555, 556, 557, 558, 559, 560, 561, 562, 563, 564, 565, 566, 567, 568, 569, 570, 571, 572, 573, 574, 575, 576, 577, 578, 579, 580, 581, 582, 583, 584, 585, 586, 587, 588, 589, 590, 591, 592, 593, 594, 595, 596, 597, 598, 599, 600, 601, 602, 603, 604, 605, 606, 607, 608, 609, 610, 611, 612, 613, 614, 615, 616, 617, 618, 619, 620, 621, 622, 623, 624, 625, 626, 627, 628, 629, 630, 631, 632, 633, 634, 635, 636, 637, 638, 639, 640, 641, 642, 643, 644, 645, 646, 647, 648, 649, 650, 651, 652, 653, 654, 655, 656, 657, 658, 659, 660, 661, 662, 663, 664, 665, 666, 667, 668, 669, 670, 671, 672, 673, 674, 675, 676, 677, 678, 679, 680, 681, 682, 683, 684, 685, 686, 687, 688, 689, 690, 691, 692, 693, 694, 695, 696, 697, 698, 699, 700, 701, 702, 703, 704, 705, 706, 707, 708, 709, 710, 711, 712, 713, 714, 715, 716, 717, 718, 719, 720, 721, 722, 723, 724, 725, 726, 727, 728, 729, 730, 731, 732, 733, 734, 735, 736, 737, 738, 739, 740, 741, 742, 743, 744, 745, 746, 747, 748, 749, 750, 751, 752, 753, 754, 755, 756, 757, 758, 759, 760, 761, 762, 763, 764, 765, 766, 767, 768, 769, 770, 771, 772, 773, 774, 775, 776, 777, 778, 779, 780, 781, 782, 783, 784, 785, 786, 787, 788, 789, 790, 791, 792, 793, 794, 795, 796, 797, 798, 799, 800, 801, 802, 803, 804, 805, 806, 807, 808, 809, 810, 811, 812, 813, 814, 815, 816, 817, 818, 819, 820, 821, 822, 823, 824, 825, 826, 827, 828, 829, 830, 831, 832, 833, 834, 835, 836, 837, 838, 839, 840, 841, 842, 843, 844, 845, 846, 847, 848, 849, 850, 851, 852, 853, 854, 855, 856, 857, 858, 859, 860, 861, 862, 863, 864, 865, 866, 867, 868, 869, 870, 871, 872, 873, 874, 875, 876, 877, 878

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[*Contractions used in these Lists.*—F.g.r. for freehold ground-rent; l.g.r. for leasehold ground-rent; i.g.r. for improved ground-rent; g.r. for ground-rent; r. for rent; f. for freehold; c. for copyhold; l. for leasehold; e.r. for estimated rental; u.t. for unexpired term; p.a. for per annum; yrs. for years; st. for street; rd. for road; sq. for square; pl. for place; ter. for terrace; cres. for crescent yd. for yard, &c.]

TIMBER.	TIMBER (continued).
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[illegible]

1st	0/10/0	0/15/0	OILS.
2nd	0/10/0	0/15/0	

[illegible]

## TENDERS.

[Communications for insertion under this heading should be addressed to "The Editor," and must reach *not later than 10 a.m. on Thursday.*]

BALLINCOLLIG (Ireland)—For the erection of solid	
Institute. Mr. W. H. Hill, architect, 28, South Mall, Co.	
Quantities by Mr. E. B. McSweeney, Marlboro-street, Cork:—	
K. W. Johnson .....	£1,292
John Lee .....	1,170
Sam'l. Hill .....	725
Walter Murphy .....	2,018
E. & P. O'Flynn .....	2,005
L. F. O'Flynn .....	2,005
D. O'Callaghan .....	2,005
D. Duffan, Cork (accepted)	



Mr. Anthony Rowse, 18, Bennett's Hill, Birmingham.	£2,100	J. & W. Webb	£1,980
Mr. Simons	2,050	J. Turville & Son, Sutton	1,950
Mr. Gill	1,990	Colclough*	1,907
Mr. Fenwick	1,995	Gowing & Ingram	
Mr. Hopkins			

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## ILLUSTRATIONS.

Monument to Lessing, Berlin.—Professor Otto Lessing, Sculptor.....	Double-Page Ink-Photo.
Design for Bath Pump-room Extension: Interior of Concert-room.—Mr. J. M. Brydon, F.R.I.B.A., Architect.....	Double-Page Ink-Photo.
Design for Bath Pump-room Extension: Exterior Perspective.—Mr. J. M. Brydon, F.R.I.B.A., Architect.....	Double-Page Photo-Litho.
Village Club and two Residences, Warnham, Sussex.—Messrs. Batterbury & Huxley, Architects.....	Double-Page Photo-Litho.

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## Further Notes on the Fever Hospital Competition.



OME further notes as to the details of the premiated designs in this competition may be of interest. In the case of a hospital in which two different classes of diseases are to be treated,

one highly infectious, the other not, an important part of the problem is to separate these two classes efficiently without dividing either of them too widely from an administration which deals with both. There is perhaps only one plan among the premiated six which really meets this problem efficiently—viz., the first premiated one for the "Park" Hospital, by Mr. E. T. Hall. Further examination of this plan convinces us that it is the best plan in the room—one of the best examples of planning with a specified purpose that we have met with. By the arrangement of the plan the length of corridors is reduced almost to a minimum, but the scarlet fever wards are most effectively separated both in access and position from the diphtheria wards, the whole administration block interposing between them, with easy and short communication on each side both in regard to the medical staff and the kitchen department. We should also add that on comparing this again with the second premiated design, we observe that the divergence in angle between one set of wards and another is really no greater than in the second premiated design, only the fact that in the first the diphtheria wards are placed at right-angles to the boundary line rather calls attention to the degree of divergence. In the second premiated design (Messrs. Hine & Stokes) both sets of wards are at oblique angles to the main lines of route and the boundaries, but in reality the difference between their angles is considerable, and the real object, as we see from the report, has been to place each set *en échelon*—a feature in which we recognise the hand of a practised planner of asylums. The projection of one ward beyond the next is, however, hardly sufficient to gain much of the advantage of the *échelon* position; the ground does not afford space for it. This is, however, a very good plan in its main lines, but not nearly so compact as the first premium. Mr. Hall, by getting his scarlet-fever blocks on each side of a

central corridor, brings them far more within compass than when, as in both second and third premiated designs, they range along one side of a corridor, which has therefore to be twice the length that it need be in the other case. In the third premium design (Messrs. Henman) the length of corridor for the scarlet-fever wards is very great; in fact, the plan is what must be called a straggling one.

It has been generally and rightly recognised by most, if not all, of the premiated architects that the diphtheria wards, where surgical attendance must be frequently required at a definite point in the disease, should be nearer to the medical staff than is necessary for the scarlet fever wards. This is attended to in the first premiated design for the "Fountain" Hospital (Mr. Tiltman) which, however, is anything but a compact design in some senses. The length of corridor is very great, especially for the service of the scarlet fever wards, all in one row across the back of the site. The administration block in this design is very well planned with regard to store-yard and kitchen; the central entry is into the large store-yard, which is the centre of the whole supply of the hospital, and on the inner side of the block is the kitchen, almost in the centre of the whole site. The two sets of wards in this plan are, however, at right-angles to each other, so that both cannot have an equally good aspect. In this respect of position the second premiated design (Messrs. Beeston & Burmester) is a better plan in the main, with the two sets of wards arranged in two rows in slightly divergent lines, one behind the other, the diphtheria nearest to the front and the administration, the scarlet fever in the rear. For working purposes, however, the plan is much spread. The administration block in this design is very well planned—one may say pleasantly planned—and with a sense of symmetrical arrangement (which is quite in place in this part of a hospital); the different classes of inmates are conveniently grouped, and nurses, matron, and medical staff have each their own garden enclosed within their own buildings.

Since looking at Mr. Emerson's clever but curious plan (third premium "Fountain") last week, in which we complained that the wards were practically radiating, we have gathered from his report that this is not oversight but design. The author thinks, comparing England perhaps with his former Indian experiences, that there is no sun worth speaking of in this country, and that therefore placing wards to get more sunlight is planning them for what they will in any

case get very little of; and his object has been to spread out his wards like a fan for the south-west winds to blow through and between. With wards all parallel, he urges, the wind will very often be blowing across from one to another, which is to be avoided. There is something in this; but medical opinion seems to sum up in favour of sun—all you can get. The plan, as we have already said, is a good one in the way of centralisation, but the diphtheria wards are not separated or differentiated at all in position from the scarlet fever wards. In short, the plan looks better on paper than it would prove in execution.

We may note what each competitor has to suggest in regard to the important and much-discussed subject of heating and ventilation. First-premium "Park" proposes heating the wards by open fireplaces in combination with hot water radiators. He shows a four-fold fireplace in the centre of the ward, so that all patients get direct radiant heat and the sight of the fire; hot-water radiators to be placed under each alternate window, with air admitted through them from gratings; each radiator to be capable of being shut off or controlled separately. There are to be withdrawal shafts communicating each with a separate upcast flue of smooth fireclay alongside the chimney flues, which will aspirate them. But what when it is too warm for fires, and when rain may nevertheless make it inconvenient to open windows? In weather that is both fine and warm we quite agree that the open window is the most healthy and efficient means of ventilation; but how much of such weather is there in England? We do not think the provision for movement of air is by any means adequate in this scheme. In the second premium design a somewhat similar combination is suggested (the fires being stoves with downward flues), but there are also to be steam "batteries" below which will send up warmed air to the wards, and extract flues actuated by cowls assisted by steam-coils at the base of the shaft. Cowls are a negative agency (sometimes); they cannot be relied on as positive extractors of any value. Of the principle proposed in the third premium design we have already spoken. In the "Fountain" plans warming by hot water is suggested, with extracts by Boyd's ventilators assisted by a gas-burner. This does not look very promising. In the second premiated "Fountain" plans we have Thermohydric ("Thermohydric") ventilating fireplaces with double flues and air chambers for admission of warmed fresh air, placed centrally in the large wards, and against the walls in smaller ones, and steam-pipes in



admission; the corridors and other appurtenances to be warmed by hot-water pipes, this portion of the warming apparatus to be kept separate, as it may be required at a time when the stoves in the wards give out sufficient heat without any aid from the pipes; which is a wise suggestion. The ventilation is to be "natural"; the ventilators carried up near flues where possible, otherwise to be carried above the roof with "automatic ventilators." Automatic ventilators are so called, to our thinking, on the *lucus a non lucendo* principle, because they can never be depended on to act. In general there seems to be much more provision in the minds of competitors for getting air into the wards than for getting it out. In the third premium design we find, however, after the same expression in favour of natural ventilation "as far as possible," that the foul air should be taken through ducts "to an air extract shaft with a powerful steam coil." This is more to the purpose than automatic cowl and such-like illusions.

The question of the access of patients to the hospital is one of considerable importance, especially where there are two classes of patients to be dealt with. The conditions demand that there shall be special admission and examination rooms for both classes of patients, with a bath-room adjoining the scarlet fever examination-room, and special discharging-rooms, consisting of undressing and dressing rooms and a bath-room for each class. In regard to the position of these the only suggestion is that the admission-rooms must be so placed as to afford easy access to the wards after admission, and that the discharging-rooms should be near the exit from the building. It would seem to be a matter of course that the admission for the two classes of patients should be as well separated as possible, and that after admission each class should only have to traverse the corridors connected with their own wards. It is also important that the admission-rooms should not be too far from the general entrance, especially when it is remembered that a case may have to be refused after examination, and therefore it is certainly desirable that people seeking admission should not have to penetrate into the grounds further than can be helped. The "Park" first premium is the only plan which meets all these requirements properly. The doors for patients are at each angle of the front block of the administration, the door for diphtheria patients on the left, that for scarlet fever patients on the right, each with its dressing-room, waiting-room, and bath-room; and patients of each class can be sent off, left and right, direct into their own ward corridors by a very short route. The only question is whether the patients' entrances are quite far enough from the general central entrance between them; they are about 30 ft. on each side of it, and on the same plane in the plan. It might have been better to spread this block a little more, and to re-arrange it so that the patients' doors would be round the corner instead of in front; though as long as patients and every one else come through the same outer gateway the comparative proximity of the doors in the building itself cannot be considered a serious further objection. Our idea would have been, a separate entrance gateway altogether for patients, but we have not noticed such a suggestion among any of the premiated plans. However, the patients' doors once gained, there can be no doubt that the internal arrangements for their reception and conveyance to the wards in Mr. Hall's plan are superior to those of any other plan; in fact they seem quite perfect. In the "Park" second premium plan the admission-blocks are also divided for the two classes of patients, and placed far away from each other on either side of the administration block, which is good so far; but that the admission and discharge departments should be grouped together, and the doors of the admission and discharge rooms facing each other on opposite sides of the

same corridor, so that patients going to the discharge-room may jostle sick patients coming into the wards, seems a very objectionable arrangement. The route to the wards from the admission-room is very short and direct as far as corridor length is concerned; but to make the admission from the corridor to the wards through the lavatory and water-closet block attached to (or detached from) each ward, and that by a very crooked route, seems a most extraordinary and undesirable arrangement. The object we suppose has been to keep the outer ends of the wards clear of obstruction, but the disadvantage in regard to the method of access seems quite to overbalance this advantage, and we cannot but be surprised to find such an arrangement in a plan one of the architects of which has had a great deal of experience in buildings of this kind. In the "Park" third premium plan the receiving-rooms are placed at the angle where the corridors of diphtheria and scarlet fever meet, so that each class of patients goes off into his own length of corridor, but the separation between the two is not very complete, and from the nature of the plan some of the scarlet fever patients must have an immense length of corridor to traverse before reaching their wards. In the "Fountain" first premium plan the receiving blocks are a great distance within the ground, being at the opposite ends of the long scarlet fever ward corridor which runs along the back of the site, and diphtheria patients must traverse the scarlet fever corridors to get to their wards. This is altogether such a bad arrangement that if this plan is carried out we should expect that it would be an absolute condition that this feature in it should be revised. In the "Fountain" second premium plan the receiving building is very central in regard to the wards, but it is also much too central in regard to the whole site, as it is right behind the administration block, which the incoming patients would have to encircle. In fact there is no plan without serious objections to its arrangements in this respect, except the "Park" first premium, in which the one defect that can be urged, a slight one, is perhaps more apparent than real.

The position of the mortuary is another little *crux* in the planning, in regard to which the conditions do not give the best advice to the competitors. The conditions say "the mortuary should be placed in a position for the convenient removal of the dead without the knowledge of the other patients—probably behind the gate-keeper's lodge." (!) This is one of the most extraordinary suggestions we ever saw made. It has always been supposed, both in theory and practice, that the mortuary should be situated in one of the most distant corners of the ground; the committee propose to place it behind the porter's lodge, which is of course a building prominent close to the entrance-gates. The object is to keep it out of sight of convalescent patients in the wards, but it might surely be possible to do this without thrusting it forward to the entrance of the site. The "Park" first premium plan gets it a little more out of the way than the committee's recommendation would suggest, but it seems to us far too near the front of the site, in fact it is actually against the boundary wall of the road. This surely cannot be desirable. In the second premium plan it is worse placed, as it is a prominent building in front of part of the administration block, standing separate. The object of preventing patients from seeing the removal of bodies to and from the mortuary is no doubt one to be kept in mind, but nevertheless the position of the mortuary in the "Fountain" first premium plan, at the back of the whole site, seems much more the correct one on most considerations.

The laundry block is a very important item, and difficult to deal with, as it is desirable to keep it away from and yet within easy communication with the wards. In the "Park" first premium it is placed in an

angle of the ground, and though it is at a long distance from some of the scarlet fever wards, this partial length of transit is the only objection to an otherwise very good position. A more central position however is better in those cases where the central area of the plan is large enough to allow of it being sufficiently isolated, and it must be remembered that it is important that the laundry should also be near the stores department, to which the washed linen has to be returned. In this respect it is very well placed in the "Fountain" third premium plan.

The internal finish of infectious wards is a matter in which finality has probably not yet been arrived at. Most of the premiated competitors suggest Parian, one or two "adamant" plaster. We have no results of experiments with this latter material. It has been shown that Parian and other cements which will take a polish are more absorbent of matter, and less impervious to penetration, than used to be supposed. Glazed bricks in themselves are the best surface possible, but then there is the difficulty of the joints. It perhaps still remains for someone to invent the ideal material for the interior walls of infectious wards; something as vitrified in surface as glazed brick, but without jointing.

Among isolated points in the premiated plans we may mention that in the "Park" first premium it is intended to entirely isolate the drainage of infected wards, and to avoid all long waste-pipes inside the buildings. The bath wastes are to discharge at once into an open trench of white glazed ware. The author also calls attention to the fact that he has grouped lavatories and water-closets in separated towers in the administration department as well as in the wards, which is certainly desirable.

The estimated cost of the several premiated designs is as follows:—

#### Park Hospital.

1st premiated design	£184,923
2nd " "	163,085
3rd " "	139,142

#### Fountain Hospital.

1st premiated design	£158,941
2nd " "	186,000
3rd " "	233,704

We should have been glad to go into some of the other designs besides the premiated ones if time and space permitted, but it is hardly possible to do more than note one or two points in some of the other designs, as in plans of this kind no definite opinion can be formed as to details without the study of the report in connexion with the plans, to an extent which the short exhibition of the drawings leaves hardly time for. In the main it is true, a glance at the block plan is sufficient in the majority of cases to show whether it is or is not worth while to give the plans any further attention. In those designs in which the one-story pavilion has been adopted, for instance, the mere sight of the block plan is sufficient to convince one that for these sites, and for what was to be put on them, the one-story pavilion is a fatal mistake. It covers all the ground, and leaves no spaces anywhere. There is a one-story plan for circular pavilions; which is absurd on the face of it, the whole ground being covered with these circular buildings with nothing but mean in-and-out corners of ground left between them. One point which is shown in No. 22 of the "Fountain" plans is a good one, the formation of the ends of the wards (towards the south) in an octagonal shape with a small day-room formed by a partition on the chord of the octagon, and a balcony outside accessible from the room. It is noteworthy that several competitors have shown the ward closets as attached to the centre and not to the end of the wards, a suggestion which was made also by Mr. Emerson in his report to No. 5 of the "Fountain" plans. The object of this is to render them more central in regard to access, and the suggestion is worth



consideration, though it seems hardly possible to place them in such a position without interfering with the light to some extent. No. 15 of the "Fountain" designs is the only one, as far as we have noticed, which shows the arrangement we have already referred to as desirable, of a separate entrance gate from the road for patients, the two gates being distinguished as "entrance to infected buildings" and "entrance to non-infected buildings," and we are certainly surprised that this idea has not occurred to other competitors. The mortuary in this design is better and more suitably placed than in most of the premiated plans; but the administration department is far too much on one side of the site for practical working. No. 13 of the "Fountain" plans is a fine set of drawings worked out with great care, the whole of the buildings on the block plan even being made out in detail. The general arrangement of wards is rather similar to that in the second premiated design (No. 23), but it is less convenient in working arrangement. In this design the closets are branched from the side of the wards, and the ends of the wards rounded into a semicircular bay; perhaps the advantage of this latter feature is more apparent than real. No. 16 of the "Park" plans is a fine set of drawings and a plan that has considerable merit, the corridors being well arranged for centralisation of working. The ward corridors form two sides of a triangle, with the wards branching out from them, a wider space or "neutral zone" being left between the diphtheria and scarlet fever wards. There is a straight centre corridor which forms the backbone of the plan, running from the administration block in the front to the nurses' residences at the back, with side communications at intervals. The design, however, would be a rather costly one. As an example of the curious want of perception among some competitors as to the actual working of such a hospital, we find one plan in which two diphtheria wards are placed on each side of the central administration block, and beyond them four scarlet fever wards on each side, separated from each other by the whole width of the site and all the intervening buildings; the object being apparently to produce "symmetry." The most symmetrical plan in appearance is not always, in these cases, the most symmetrical in working.

If it can hardly be said that the competition has in any important element advanced the planning of hospitals beyond the point at which it was previously, it has produced several good suggestions in the way of general planning, paramount among which is the admirable and quite exceptional plan of the first premiated design for the Park Hospital, which is quite a study in this way.

## NOTES.

THE answer given by the First Commissioner of Works last week to an inquiry in regard to the alterations in the precincts of Westminster Abbey was satisfactory as far as it went. Arrangements have been made for the purchase of certain interests in connexion with houses in Poets' Corner and Old Palace-yard, but possession of the property cannot be obtained till the middle of next year, when it is proposed to demolish the buildings. "The public," said Mr. H. Gladstone, "will then be in the best position to judge what ought or ought not to be done," and he proceeded to give an assurance that the Government would come to no final decision on the question of a monumental chapel without giving Parliament an opportunity of expressing its views thereon. Unfortunately the number of members of Parliament whose "views" on such a subject are of any value is very small, but there may be an opportunity of teaching some of them beforehand, now that it is known that no offer for a chapel will be accepted without full public discussion. It

is to be hoped that when we have a new and a better view of the eastern portions of the Abbey thrown open by the removal of the houses in question, one result will be so to bring out the picturesqueness of grouping of this part of the ancient buildings that there will be a general desire not to see them spoiled by the tacking on of a disproportionately large new chapel which can never appear as in any essential sense a portion of the Abbey. If any addition for such a purpose were made (and we doubt if it is in any case advisable or called for) it can be done in a much better way than that, as we may take an opportunity of showing on some future occasion.

FROM a preprint of the Athenian *Mittheilungen* that has reached us we learn that the Enneakrunos excavations have brought about incidentally a discovery of the first topographical importance. Dr. Dörpfeld has been hunting for the Oedion; he has not yet found it, but he has come upon a building of even greater importance—i.e., the ancient shrine of Dionysos in the marshes (*iv λῑπραις*). He first discovered, just opposite the Lesche, a Late Roman structure which is proved by an inscription to have been the place of the assembly for the Thiasos of the Iobacchoi mentioned by Demosthenes. It was part of the general sanctuary known as the Bakcheion, and consisted of a hall 11 by 18 metres in size, divided into three aisles by columns, of which the foundations remain. At the end of it was a quadrangular apse containing several altars and a number of votive sculptures and inscriptions. These are shortly to be published; but for the present we can only note that on digging deep down below the Roman pavement the excavators came upon an ancient structure of polygonal masonry. This proves to be the boundary wall of an enclosure or *temenos* 40 by 20 metres in size. Within this enclosure have been already found (though only a third of it is so far laid bare):—(1), a mass of fragmentary black and red ware belonging to vessels of large size; (2), the substructure of an altar or table of poros stone, on the western step of which several stele had stood; and last and most conclusive, the remains of an unmistakable Greek wine-press. Its shape and arrangements generally are closely analogous to the wine-presses still used by the modern Greek peasants. It is scarcely open to doubt that we have here the primitive sanctuary of Dionysos Lenaos of the wine-press—the god who dwelt in the marshes. According to Thucydides (ii., 15), his sanctuary lay close to the Acropolis and to the Enneakrunos, and there the more ancient Dionysia were celebrated in the month Anthesterion.

IT is interesting to notice that at the "Congrès des Arts Décoratifs," held two or three weeks ago at Paris, a resolution was passed that, in future, instruction in the Schools of Decorative Art should be carried on under a programme which would treat architecture as the central subject of study, and as the connecting bond between all the branches of decorative art. This is a noteworthy step, which may be expected in the long run to have very good results on the study of decorative art in France. The Congress also moved that a special sum should be set apart in the annual Budget of the Government for Fine Arts, for the decoration and furnishing of some rooms in the national buildings. This is certainly as directly in the interests of art as the expenditure of money in the purchase of works of painting and sculpture.

DR. THEODOR SCHREIBER has just published the first volume of an important work, "The Goldsmith's Work of the Alexandrian Age" (Alexandrinische Toreutik). The treatise, which is complete in itself and printed separately, forms part of the "Transactions" of the Königl.-Sächs

Gesellschaft der Wissenschaften at Leipzig (vol. xiv.), and is the first instalment of a series of investigations on this branch of Greek art during the "Ptolemaic period." It is fully illustrated with five plates and 138 cuts in the text, and is a most valuable contribution to a somewhat neglected department of Greek archaeology. We have only space here to note that the writer calls attention to one important source for our too scanty knowledge, i.e., the Græco-Egyptian moulds which often allow us to reconstruct the design where the actual gold work is lost. Naturally no other department of art has suffered so badly from both the carelessness and the cupidity of successive generations, and these moulds are really indispensable to anything like a complete survey of the subject. A glance through the illustrations will show that nearly all the important museums of Europe have been laid under contribution.

AN American firm has recently brought to this country a rather remarkable apparatus—if such it can be called—for purifying water, known as the "Nibestos" filter. Professor John Attfield, who has carefully examined it, states that in an experiment he passed a sample of Thames water through the "sterilized filters" and made plate cultures before and after filtration. The Thames water before filtration contained from 10,000 to 30,000 microbes in every cubic centimetre, but after being passed through the filter no microbes whatever were found in it. This result was certainly very extraordinary, and we thought it worth while to enquire into the composition of the filter. It appears that the sole medium through which the water passes is a film of "Nibestos," the nature of which the firm in question will not divulge, though they admitted it might be made in several ways. But we have seen Canadian asbestos before, and are vastly mistaken if the said film does not consist of that, after the elimination of the magnesia and some other impurities which would affect the taste of the water. However that may be, the filter is very simple, and the thin, cloth-like film is easily taken out and re-adjusted, or replaced by a new one. It is not, neither does it profess to be, more than a mechanical apparatus—i.e., it removes suspended matter, of any degree of fineness, even down to the smallest microbe, and does not exert any chemical action on the water. Thus if the water were impregnated with nitrates or nitrites as the ultimate result of sewage decomposition, or contained lead, or were of abnormal hardness, the "Nibestos" filter would be powerless to deal with it, though it would strain off any bacteria that might have been present feeding on sewage matter, and when the latter existed in suspension would eliminate that also. Desirous of ascertaining for ourselves the capability of this film to separate very finely-divided particles from water, we subjected it to the iodine starch test, and the results fully justified what is claimed for it—the turbid sample of water after filtration was beautifully clear and bright. The use of asbestos as a filtering medium is not by any means novel, but it does not appear to have been applied in quite the same manner as that now under consideration. The special property of the "Nibestos" film has no doubt been brought out by the method of preparation of the asbestos and its subsequent manufacture, whereby exceedingly minute pores only remain for the water to pass through. In time these become clogged up, depending on the quantity of suspended matter removed, but in any case the film is stated to last some months. It cannot, as before mentioned, purify water organically polluted, so that really bad water cannot be rendered good thereby; if it were made in combination with filters doing a certain amount of chemical work also, the result would possibly be an improvement all round. There is, no doubt, great need for such filters on the other side of the Atlantic,



where the water as supplied to the public is frequently full of suspended matter, but in England there is not such a scope for them. We may not be always as particular as might be in selecting the source of supply, but we are at any rate careful to eliminate as much extraneous matter as possible by filtration before sending the water to the consumer.

A DOZEN prominent members of the fire service in England have recently paid a visit of investigation of the fire protection of capitals like Amsterdam, Berlin, Vienna, Budapesth, &c. Everything that was of importance was brought to their notice. Mr. Dyson, Chief Officer of the Windsor Brigade, led the party, and Mr. Edwin O. Sachs, an architect who is connected with the foreign service, had charge of the arrangements and the explanation of the fire preventive legislation, &c. Thanks to the courtesy of the local authorities, the visitors not only received a good illustration of the various means of contending with fire, but also a thorough knowledge of the risks that had to be dealt with, and the powers of the authorities to prevent catastrophes. The question of theatre-protection occupied considerable attention; the new Opera House at Amsterdam was shown to the visitors as a model of modern construction, whilst the new Opera House at Budapesth afforded the most unique example of carefully-arranged fire-extinguishing apparatus. It was here that the authorities actually had the whole gigantic stage put under water for half-an-hour to show the visitors how easily they expect to swamp a fire by means of their endless lines of sprinklers; and if we note that, when the garrison of Budapesth was alarmed at midnight to show our countrymen how quickly the firemen could have a strong force of troops to assist them, and two regiments of infantry were at work twelve minutes after the call, we have little doubt that, as far as it is in the power of the Hungarian authorities to prevent it, a repetition of the Ring Theatre catastrophe will not take place in their capital.

A VERY interesting description of the tower of the New City Hall at Philadelphia, Pa., is given in a paper read by Mr. C. R. Grimm before the American Society of Civil Engineers, and lately published in their "Transactions." Up to a height of about 337 ft. from the level of the street, the tower is of brick faced with marble. In order, however, to avoid excessive pressure upon the foundations the commission in charge of the erect on of the building decided to construct the remaining portion, which is about 173 ft. in height, of metal. The framework of this upper portion is wrought-iron, and is octagonal in plan, and on the top of this construction there is to be placed a colossal bronze statue of William Penn, which is 37 ft. high, so that the total height from the ground level to the top of the statue is no less than 547 ft. In proportioning the various parts of the ironwork the loading was considered to be 100 lbs. per square foot for the floors and balconies in addition to their own weight, and a wind pressure equal to 50 lbs. per square foot has been provided for, this pressure being assumed to act horizontally against the shell, the surface of which, for this purpose, is regarded as vertical throughout. Mr. Grimm also gives the observed horizontal movements of the masonry tower due to the influence of the sun. The maximum deflection at the top of the masonry (that is, at a height of 337 ft. above the ground) was  $\frac{1}{2}$  in. Such movements as these are seldom recorded, although they always occur, owing to the sun heating one side of a building more than another. In the case of the Forth Bridge, which runs north and south, movements from this cause were very considerable, the ends of the cantilevers moving away from the sun as their sides which were most heated expanded.

THE Architect of the Berlin Houses of Parliament, Herr Paul Wallot, has decided to accept the Architectural Professorship at Dresden Royal Academy which was offered him some time back. He succeeds Professor Lipsius, whose predecessor was Gottfried Semper. Herr Wallot will, however, continue to superintend the completion of his building in Berlin, though he will reside at Dresden after October next. The opening ceremony of the Houses of Parliament is announced for October.

IN one of the halls of the Eastern Railway Station at Buda-Pesth there are at present on view the competition designs for the two proposed bridges over the Danube. One of the bridges is to cross the river in one span at the lower end of the city, the other in three spans close to the present Customs-house. Together they were not to cost more than 420,000*l.*, and large premiums had been offered besides the commission. Seventy-six sets of drawings have been sent in, of which ten came from England and sixty from America. The International Jury has decided that the first premium for the one-span bridge (a suspension bridge) should be given to Herr Kuebler, of Esslingen, in Germany, who was ably assisted by a Stuttgart firm of architects. The premium for the three-span-bridge has been awarded to Herr Feketezhazi, of the Hungarian State Railways. Both bridges, if carried out, will be ornaments to the town, and will in no way disturb the fine scenic ensemble of which Buda-Pesth is justly proud. We are only afraid that the German engineer stands but little chance of seeing his work carried out in a country so anti-German as Hungary.

THE *conversations* of the Institution of Electrical Engineers was held in the rooms of the Royal Institute of Painters in Water Colours on the 31st ult., when the guests were received by the President and Mrs. Siemens. The smallness of the rooms entirely prevents the exhibition of some of the latest developments in electrical work, such as might reasonably be expected at these gatherings. Indeed, the sole form of amusement provided—a small band—takes up space that can be ill afforded. On the present occasion the cloak-room accommodation was exhausted within less than an hour, and later arrivals had to find a path amidst hats and coats that were scattered on the stairs as well as on the landings. The membership of the Institution is a growing one, and it is earnestly to be hoped that rooms may on future occasions be found in which members may at least have space to freely circulate amongst themselves.

THE retirement of Sir Edward Watkin from the chairmanship of the Metropolitan Railway and two other railway companies is an event of considerable general importance. It is probable that it will put an end to the idea of another main line from London to the North over the Metropolitan and Sheffield systems, and that for the future the Metropolitan Railway will devote itself more to its London and suburban traffic, and that the intention of making it a part of a general system will be abandoned. It is doubtful, with all Sir Edward Watkin's ability, whether his reign has been beneficial either to the public or to the shareholders of the lines which he managed. He has been actuated by ambition and by a pugnacity which do not make up for more plodding methods. Not one of the lines over which he has presided has ever shown any inclination voluntarily to improve its accommodation for the public. Nothing, as we all know, could be worse than the second and third class accommodation on the Metropolitan and South-Eastern lines; nothing could be more disagreeable and unhealthy than the stations on the former line, and there has never been the least

appearance of a desire on the part of the company to improve them. Without any great expenditure of money it is quite certain that things could have been bettered, and if the person who was at the head of affairs had desired to do the best that was possible for the public, it is quite certain that something ere this would have been accomplished.

A MONUMENT to the late M. de Neuville, the eminent painter of military subjects, has recently been unveiled in the Montmartre Cemetery at Paris. It is executed in white marble, from the design of M. de Saint-Vidal. The back of the monument represents the gateway of the cemetery of Saint-Privat, which the painter has reproduced in one of his best-known pictures, with a bust of de Neuville above, surrounded with inscriptions recalling his principal works. In front a figure representing "France" holds in one hand a palette and brushes and a sword, and in the other a branch of laurel; a *débris* of arms and military appurtenances is at her feet. This last incident is in rather poor taste, but the idea of commemorating the Saint-Privat gateway on the monument is a good one. Certainly de Neuville acted the part of Tyrtæus to the French army in relation to the sanguinary struggle at Saint-Privat. Thousands of persons who would have known and remembered nothing of the heroic stand made by the small body of French on that occasion have had it made memorable for them by de Neuville's work—one of the most real and spirited battle-pictures ever painted.

AT Messrs. Bellman, Ivey, & Carter's Gallery in New Bond-street will be found a charming collection of small bronze reproductions, chiefly of recent French sculpture. Among these are Larche's "La Prairie et le Ruissseau," which in its plaster form obtained a first medal at last year's Salon; the same artist's figure of "Christ before the Doctors" as a statuette, and a life-size reproduction of the very beautiful and expressive head; there is also the full-size head from M. Myslbe's powerful but painful figure of the Crucifixion from last year's Salon. Among the other bronze statuettes are M. Gérôme's "Bethsabee," M. Hugues' "La Muse de la Source," a splendidly-designed figure seated on an edge of a decorative trough or cistern which plays an important part in the design; M. Beguine's "Charmeuse," a girl playing on two pipes, which will be remembered in last year's Salon; and a good many others. The collection includes also two or three pieces of pewter work, vases and plaques, by Vibert, Akerman, and Desbois, which are as fine art in their way as the statuettes.

A MEMBER of a very well-known firm dealing in materials and patents used in building sends us copies of a few out of many letters he has received from the employés of firms with which he has dealings, which disclose a practice which, as our correspondent truly remarks, any firm desiring to be considered reputable should put a stop to. It seems that it is becoming a custom among employés when preparing for their annual holiday to send out requests for subscriptions to the heads of firms with which their own house has dealings. The following are among the specimens sent to us, and received by one person:—

"Account 1*g*l., paid 7*l*."

We beg respectfully to inform you that we, the employés of A. B. intend taking our annual out of the favour of your kind support will be greatly esteemed."

"Account 1*g*l., unpaid."

We respectfully remind you that our annual excursion takes place next month. As we almost entirely depend upon contributions received from firms that we trade with, and other friends, to make the trip a success, we hope that you will give us your liberal support, as all money received is entirely devoted to make the day's out enjoyable to many families with no other chance of getting away. No Christmas appeal is made. Please reply as



soon as possible to save further applications, to our book-keeper, Mr. ———.

"Account *Gal.*, paid *gal.*"  
It is intended by the employés of Mr. 'E. F.' to hold their annual banquet at an early date in the summer. To this project Mr. 'E. F.' has kindly given his assent, and also granted us permission to take a day's holiday. A fund has been opened to which our employer has subscribed, and with a view of further augmenting it, we venture to solicit your help, and on the ground of our business relationship we hope you will favour us with a subscription."

Our correspondent adds that his men have an annual outing towards which he gives each man a day's pay, and the cost of conveyances, but prohibits any appeal to his business friends. It is to be hoped that others will follow his example, and put a stop to a most improper and annoying practice.

#### ARCHITECTURE AT THE ROYAL ACADEMY.—IV.

"A HOUSE AT OXTEAD" (1,600), by Mr. Harry Redfern, is shown in a couple of little coloured elevations and two plans to the same scale; a pretty little country house, stone walls below and half-timber above, and meritorious also in that the plan is treated as of the same importance with the elevation. "A New Shop Front" (1,601), by Mr. M. Starnier Hack, is a type of drawing which has come in lately in the Architectural Room, a small tinted elevation with a section of the front wall, a business-like style of architectural drawing on a small scale; there is nothing very special for comment in the design. Mr. Daniel Breda's "St. John's Church, Basenthwaite" (1,603) is a pen drawing of a pretty country church with a spire mounted on an octagon stage, rather reminding one of Stanwick. In Mr. Butler's "Harrington Board School, Second Premiated Design" (1,605) we have a very well-drawn perspective view tinted in monochrome, of a school in recognisable School Board style, with a plan in the corner which does not tell us very much, as the names of the rooms are not given.

The large perspective drawing of "Design for the Decoration in Graftito of a House at Lisbon" (1,606), is signed by a name new in this exhibition, that of Mr. T. G. C. Formili, an Italian decorative artist settled in London recently, and who is desirous, we believe, to apply to London interiors a form of decoration which in the more favourable climate of the south he has applied, as in this case, in external decoration. Mr. Formili uses graftito, or as we more commonly call it, sgraffito, with a much thinner and more delicate upper film of plaster than has been used in such examples as that on the walls of the Science Schools at South Kensington. The drawing is a very good and effective one, and the general effect of the decoration, applied very liberally over the surfaces of the wall between the windows, has a rich and graceful effect, though not in what would be thought here the best style of design; and the figures are treated rather too pictorially, giving them somewhat of an illusive appearance of relief. Still, this is an interesting and effective novelty among the Architectural Room drawings.

Mr. Freeman's "New Stables, Graythwaite Hall, Windermere" (1,609) is a rather effective bird's-eye view of stable buildings extending round three sides of a quadrangle, in a simple Gothic style, with stone walls below with rounded corners, and an oversailing story above of half-timber work. It makes a picturesque and yet solid-looking group of buildings, and looks like what it is meant for, without aiming at any striking effect.

Mr. Goldie's "Church of St. Thomas of Canterbury, Wandsworth" (1,614) shows in a pen drawing the interior of a church of what may be called a one-story nave, an arcade only without triforium or clearstory, with a boarded roof in the form of a segmental arch, with moulded tiebeams, and aisles with flat panelled roofs at the level of the tiebeams. The piers have an octagon plan with the faces slightly hollowed, leaving an edge at the angle; a somewhat weak-looking section, but interesting as a variation on the octagon pier. Next we have a geometrical drawing by Mr. R. Blomfield (1,615) of "Borrowstone Lodge, Deeside," which from the colouring of the plan appears to be in fact alterations to an old house. As far as the plan is concerned these are small but important, including a circular room effectively placed; but we imagine the treatment of the rather high-pitched roofs with their very projecting eaves, and the large octagon gable rising above them with a

domical roof, is new and the work of the present architect. We should have liked better to have seen the gable, as it is a large feature in the design, with some reference to the plan instead of being merely set on the roof; but it will be a very pleasant feature in the house, large enough to take one's ease in in fine weather, and not a mere look-out turret. The architecture is of the plainest description of red brick walls with light-coloured stone quoins; but in spite of its plain character, the whole is so well put on paper that it makes quite an attractive drawing. "A Pair of Semi-detached Houses in Melbury-road" (1,617) by Mr. Halsey Ricardo, a remarkably clean and bright-looking pen drawing in perspective, is somewhat allied in character to the last-named house, being also sternly plain in its wall and window treatment, and with the same high roof with great projection at the eaves. Mr. E. B. Lamb's "Small Art School for a Country Town or Suburb" (1,618) is too high to be well seen, but looks pleasantly picturesque and rural in character.

The "Restoration of the Chancel, Canewdon Church, Essex" (1,621), by Mr. W. Hargreaves Raffles, is a perspective interior which does not tell one much, as there is nothing to show what the chancel was and how much has been done; the French system of always giving a drawing of the actual state before restoration is far better, and gives much more interest to a drawing of this class; and though want of space in the small Architectural Room at the Academy might preclude the hanging of an extra drawing to show the "actual state," a small sketch could at least be given in the same frame. It is really very little use hanging a drawing of a "restoration" unless we know what has been restored. Mr. B. F. Fletcher's "Moorland Church with Sunday-school and Shelter for Horses and Carriages of Distant Parishioners" (1,622) is a quite poetic little water-colour drawing, showing a group of plain but not picturesque buildings in the middle of a rather gloomy landscape; one may presume, perhaps, that this is an imaginary group, but the drawing is quite worth having. Mr. Graham Fairley's "Village Church, Broxburn, West Lothian," (1,623) is to our thinking not quite simple enough, or one might say humble enough, in architectural style, to represent essentially the character of a village church; as far as design goes, it might seem as much in place as a small town church; but it has the merit of mass and solidity.

"Athelhampton Hall, the additions to House and New Garden," (1,624), by Mr. Inigo Thomas, is one of the most curious-looking drawings in the room, suggesting rather the idea of a model of a house and gardens, with green cloth for the turf; but it will bear looking into. The house occupies only a very small space in the middle distance of a strongly-coloured view, showing, in the foreground portion, two large courts of unequal size, one with a long basin and fountains, the other laid out in ornamental parterres, and between these and dividing them is a narrower piece of ground, diversified with cut architectural trees and shrubs; this leads up to a point nearly facing the house. "A Preliminary Essay" (625) is a sheet covered with a mixture of plans and part elevations, we presume referring to the same house. It is curious that those whom we may class as the "anti-Institute" architects seem to labour under a tribal infelicity as to getting the doors of their rooms in the wrong places; at least this is the third instance we have noticed among their ranks. To place the door of an ordinary sized dining-room in the middle of one of the long sides is certainly to spoil the room; to place a kitchen door opening right upon and close to the fireplace is still worse.

The Bond-street Façade of the County Council offices for Wakefield (1,628), is shown by the architects, Messrs. Gibson & Russell, in a large and powerfully-coloured perspective drawing, and without suggesting anything for special comment, seems an effective piece of municipal architecture. They also exhibit the design for Craighall School, Leith (1,630). A design for "A Labour Church" (1,629), by Mr. G. L. Morris, is too small and too high to be well seen; it is a brick church in a cross form. The same architect exhibits "A Village Church" (1,650), also a small elevation drawing, which looks good at a distance, especially in the shape and proportion of the tower, though we should have thought the too pronounced effect for a village church. The "South-Eastern Agricultural College, Wye" (1,631), by Mr. Paul B. Chambers, is too high to see the plan, but the design has the merit, for its purpose, of looking at the same time collegiate and

rural. Mr. Stevenson's three "Porches of London Houses" (1,632) are interesting; by far the best is the centre one, with the immense bracket supporting two large and deep arches over the entrance, and into which the heads of the hall windows fit. In the drawing on the left the doors of two different houses close together, with cornels of such very different proportion and design, look rather out of keeping.

Mr. Belcher's larger drawings we have already referred to. It is not easy to see what the decorations are in the "New Stalls and Decoration to Church, Pye-street, Westminster" (1,636); we see stems on the walls of something which branches into leafage, but we do not know what it is. Pen line is a bad medium for showing decorative work. The small angels under the end of the roof-beam look rather too much as if they were crushed by it. Mr. Mountford's "St. Mary's Church, Summers Town" (1,633), is an Indian-ink washed drawing of a church about which we can say nothing in particular; a much more characteristic drawing is that of the "Principal Entrance and Tower of the Northampton Institute" (1,634). This is a powerful piece of building. Mr. Belcher's "Endall's Manor, Wargrave" (1,635), if it is a new house, looks a great deal too much like an old house built at different periods; perhaps it really is so; there is certainly very little relation between the large brick tower and the half-timbered wing which projects at one side of it.

Why has Mr. Pite "revised" the design of his English Mission Hospital (1,642)? If the reason has been in regard to the plan, we doubt if the semicircle scheme is an improvement. The sections look as original and artistic as in the first design. Messrs. Douglas and Fordham's "Lodge and Gates, Eaton, Cheshire" (1,645) has the orthodox picturesque character of a lodge, well shown in Mr. Hodgkinson's admirable drawing; but the character of the iron gates and railing does not appear to us in the least to harmonise with that of the building, if they were actually designed together. The other drawing, "Fort Sunlight Schools, Cheshire," (1,646), by the same hand, is a picturesque piece of school building, in which the octagon at the angle, with the large timber bell-turret on it, comes in very effectively; we regret that no plan is given. What are the buildings so vaguely described by Mr. Seth-Smith as "New Buildings in the West of England" (1,649)? Rather a large title to append to what looks like a farmhouse or a collection of cottages, with large widely-sloped roofs and timber in the upper part of the gables. The drawing is a suggestive one, we had almost said poetic; but the buildings are a puzzle. Mr. Jemmett's elevation of a design for "Darlington Municipal Buildings" (1,653) has some of the look, and also some of the merits, of a French Hôtel de Ville design for a Paris suburb; we should have liked the circular heads of the windows kept down to the parapet line, or with something to back them; they look rather in the air as it is. Mr. Arthur S. Jones exhibits a pleasing Gothic elevation for the same building. Neither have plans; even more important with an elevation than with a perspective. Messrs. Beeston & Burnmaster exhibit two views of the hall and staircase of Hurstbourne, Hants (1,654, 1,655) of which we have published some exterior views.

Mr. H. D. Wilkinson's "New Front of St. Philips, Clerkenwell," seems a little inspired by J. D. Sedding; a large window in late Gothic style is shaded by a deep arch, the mouldings of which abut against a large projecting buttress; a wide shallow segmental arch below shelters the porch. The whole is effective; the buttress would have been all the better for being a little more massive in the way of thickness. Mr. Skipworth's designs for churches at Abbeydale and Watton-le-Dale (1,663-4-5), small drawings executed in pencil and delicately tinted, are among the most charming and original designs in the room; the author has a beautifully delicate touch and style in working up these drawings, which are obviously personal work, and the designs have great originality and fancy in the treatment and invention of Gothic detail. The design of the west end in No. 1,664, for instance, with its bold arch treated with different coloured bands of stone, abutting against turrets finished in the same manner, and with the central buttress or turret cutting through the arch, makes a bit of effect which, if found in an ancient building, would be in many a sketch-book. We may doubt, however, whether the Abbeydale design, with its wide one-span roof, would look as well in perspective as it does in elevation. It is a pity to see that such charming drawings and such delicate fancies in



design have been thrown away on unsuccessful competition drawings, but we have no doubt the author will have his opportunities in time. With these we may mention "A Town Church" (1,669), by Mr. S. K. Greenslade, a very small and delicate pencil and colour study, in elevation and section, of a church of considerable originality of design, but of which we prefer the interior to the front. It is a round-arched church with aisles for passage only, and the arches carried up the full height of the building, with a segmental ceiling; a great look of grandeur would be gained in this way. The exterior looks a little too much like a secular building; it might almost pass for a theatre façade.

#### MAGAZINES AND REVIEWS.\*

In the *Art Journal* Dr. J. P. Richter commences a series of "Critical Studies at the National Gallery," commencing with Leonardo da Vinci, illustrated from a number of reproductions from da Vinci's original drawings. There is an article on the setting of precious stones by Mr. Ashbee, and one on "The Paris Salons" by Mr. William Sharp, which is a piece of very good and discriminating criticism, a striking contrast to the insolent disparagement of all contemporary painters which is becoming the latest fashion in literary magazines.

In the *Magazine of Art* an article on "Some Portraits of Byron" will interest many readers, artistic and otherwise; so will Mr. Seymour Lucas's paper, with illustrations by himself, on "The art of dressing a historical play" ("an historical" it is in the printed title, which we consider a heresy; why is the "h" to be dropped?) The illustrations to Mr. Walter Armstrong's paper on "The City of Dordrecht" are charming specimens of tone-block illustrations. The editor contributes the second number of a good critical article on the Royal Academy Exhibition. Altogether an exceptionally interesting number.

The most important articles in the *Studio* are one on "Studies by Japanese Artists," by Mr. Frank Dillon, and one on "Leather embossing as an artistic handicraft," by Mr. F. Kreukel.

In No. 7 of the *Architectural Review* we have an article on "A Glimpse of Modern Greece," by Mr. Thomas A. Fox. The illustrations include a carefully-outlined detail drawing of the church of the Corpus Domini, Bologna, by Mr. C. H. Blackall. Why, in an American paper, this is called an "envoi" of the Rotch Travelling Studentship, we do not know, except from the crazy habit of imitating everything French which has seized hold of American artists. They had better adopt the French language at once.

The *Antiquary* contains an interesting article on "Ancient Ships" and some criticisms on the Royal Academy from an archaeological point of view, "The Antiquary among the Pictures," which are of interest and may be of value to artists.

The *Illustrated Archaeologist* (No. 5, vol. ii.) gives some notes and sketches of sculptured tympana in Norman churches, from information supplied mainly by Mr. Arthur G. Langdon, with illustrations from rubbings. One of these, at Trenglos, is a very curious kind of crude reminiscence of a Classic motif. One might say the same of the Menhir-Autel at Kernuz, to which another article is devoted; the sculpture on this (mostly of nude figures) is like a kind of barbaric suggestion of the column sculptures of Ephesus. The number includes a paper, with plans, on the excavations at Silchester in 1893.

The *Fortnightly* contains an article on the Royal Academy by Mr. D. S. MacColl, and one on the two Salons by Mrs. Pennell, both of which are typical of the present tendency in what is called "art-criticism," which seems to be to pick out for commendation two or three (generally rather *outré*) works which lie within the lines of a certain narrow circle set by the critic, and to treat all the rest of the exhibitors with sneers and contempt. To Mrs. Pennell, M.M. Rochegrosse, Detaille, Besnard, Bonnat, Bouguereau, Henner, Benjamin Constant, &c., are all so many fools and impostors; only Mr. Whistler's distorted portrait in the Champ de Mars Salon is a masterpiece for all time! After reading such articles as these,

one does not wonder at the angry contempt with which artists speak of what is called "criticism." The same number contains an article by the Prince of Monaco on the proposed Channel Bridge, in which for the first time (except in our columns) we have found anyone publicly pointing out the grave and inevitable dangers to shipping which such a construction must involve, a point to which all the engineers seem to be absolutely blind.

The *Nineteenth Century* contains a couple of trenchant articles in reply to Sir B. Baker in regard to the Philæ reservoir, by Mr. Mahaffy and Mr. Frank Dillon, which we hope will be widely read.

Mr. Mahaffy quotes significantly the figures from Mr. Wilcocks's report, which give the difference in cost between the dam at Kalabshah and that at Philæ as 200,000*l.*; *i.e.*, 1,600,000*l.* for the Kalabshah reservoir and 1,400,000*l.* for the Philæ reservoir, and asks whether it is on the ground of this proportion of difference of cost that Sir Benjamin Baker chooses to call all schemes but his own impossible. Referring to Sir B. Baker's remark that Lord Cromer and his adherents can and will do the work in spite of all opposition, "but will look for, and doubtless obtain, the encouragement and support of the Home Government," Mr. Mahaffy characterises this as "the language of a set of bullies, who have determined upon an act of tyranny, yet are afraid of public criticism."

The *Nineteenth Century* contains also another of those articles characteristic of the day, which are called "Art-criticism," and which consist in the wholesale abuse of all painters right and left, except Mr. Whistler. Ignorant as English magazine editors generally are of art, it is really surprising that so many of them should be ready to print this kind of stuff, unless indeed they have come to the conclusion that it "pays"—the end of too much magazine and review-writing in the present day.

The *National Review* contains the most amusing article by Mr. Mortimer Menpes on "The Actualists"; a sketch of the history and the doings of a clique of artists of the new school, with aspirations and discoveries that nature could all be reduced to three tones—or five, according to the theory of the moment. One of the three-tone men painted a lady in brilliant sunshine, her hair cobalt-blue, and her face a combination of lemon tones with rose madder. "But that is not my wife," said the husband. "It is your wife in sunshine," answered the artist with calm superiority. On the husband saying that he wished a painting of his wife as he saw her, it was pointed out to him that he had never seen her, he had only looked at her; "it is only the artist who sees his subject." The whole article is a capital satire on the ineffable priggishness of a certain type of young painters. We used to suppose that Mr. Menpes himself was an "actualist"; has he seen the error of his ways?

We do not know why an article on Philadelphia in *Harper* should be entitled "The City of Homes," but from the illustrations there seems to be a dignified and rather stately style of mansion prevalent there; not, however, especially home-like. Old Salem, as described and illustrated in Mr. Howell's article on "My First Visit to New England," seems to merit the title more. Also in Cambridge, U.S.A., are some pleasant old houses, Longfellow's former abode among them.

The *Century* contains an interesting illustrated article on the art of M. Boutet de Monvel, including some engravings from his charming illustrations to Fabre's "Xavière et Landry," the originals of which were exhibited some little time since in Messrs. Goupil's former gallery in New Bond-street. The same number contains an illustrated article on "Book-bindings of the Present" by Mr. Brander Matthews, chiefly concerned with modern French bindings. Mr. Matthews suggests a new idea of relationship between the book and the material (not only the design) of the binding, such as covering Mr. Austin Dobson's "Vignettes in Rhyme" with a remnant of damask or golden brocade from a dress of the period to which they refer. The idea is suggested by two curious bindings of Victor Hugo's "Napoléon le Petit" and "Les Châtiments," each of which, bound by Petit, is decorated with one of the symbolical bees cut from the late Emperor's throne at the Tuileries, after the Franco-German war! But this suggestion, which must be of very limited application, is rather fanciful than practical. A short article on Tissot's "Illustrations to the Bible" is also worth attention.

In *Scribner* artistic subjects are only represented by a short article by Mr. Hamerton on Mr. Stanhope Forbes, in connexion with an

engraving of his picture of Newlyn Lighthouse. In the course of the article it is mentioned that the sending up of the Newlyn pictures for the London exhibitions has become such a regular traffic that the Great Western Railway has built a special van for picture-carrying; the first instance of the kind, probably.

In the *Gentleman's Magazine* Mr. W. C. Sydney writes a historical sketch of St. Albans under the title "A Pilgrimage to a Famous Abbey," the odd point about which is that the author refers to the excellent restoration of the cathedral by Sir Gilbert Scott, and asserts that in its restored condition "St. Albans may well lift up its head," &c. Whether this is sheer ignorance, or intentional ignoring of all that has been done since the building passed out of Scott's hands, it is difficult to understand; but we suspect the former is the real explanation. Mr. Sinclair contributes an article on "Some Curiosities of Westminster."

The *New Review* contains an article by Mr. W. M. Conway, of recent Himalaya fame, on the "Development of Mountain Exploration." The article is mainly a brief historical sketch of the progress of mountain climbing.

Miss May Kendall's little poem in *Longman's Magazine*, "Psyche and the Potboilers," is a verified moral for artists. "Psyche" was the artist's one effort after something higher—

"She's lying face downwards: I never  
Look at her, for fear I should see  
She's wondering if she could ever  
Have really been painted by me!"

In the *Atlantic Monthly* Mr. J. W. White gives an account of "A Summer in the Scillies"; Mr. Albert Shaw contributes an article on recent sanitary work in Hamburg, and Mr. Henry J. Fletcher one on "American Railways and American Cities," giving a curious and not edifying account of the system of railway exploitation in the States, with the conclusion that it must end in "nationalisation or a universal pool."

In the *Cornhill Magazine* an article on "Castles in the Air" is a collection of notes, put into popular form, on remains of lofty and inaccessible rock dwellings in various parts of France.

In the *English Illustrated* will be found an illustrated article by Mr. Stanley Lane Poole on "Saracenic Metal-work"; a more important and serious article on an artistic subject than we have recently encountered in this magazine.

The *Idler* devotes an article to a description of life at Girtton College, with illustrations of the buildings and rooms; not intending to suggest, we presume, that the subject is peculiarly suited to a magazine with such a title.

The ninth issue of *Punch Pictures* includes Leech's series of Mr. Briggs's salmon-fishing adventures, and Mr. Du Maurier's now proverbial "Are you intense?" but we regret not to find the sequel of Robinson's jealousy of Doyle at the ball, one of the best set of sketches Doyle ever did.

We should be glad to see a little more of Doyle's work in these reproductions; his "Manners and Customs of ye English People" was a delightful series of satirical sketches of society in his day, now nearly forgotten, and quite worth reviving.

The third number of *A Beautiful World*, the little quarterly periodical issued by the "Society for Checking the Abuses of Public Advertising," contains two or three pleasantly-written articles of more than ordinary literary merit. Mr. Waterhouse contributes a short and strongly-worded protest against a recent piece of advertising vandalism whereby the finest view of Durham Cathedral, from the opposite bank of the river, has for the present been hopelessly spoiled and vulgarised; it is to be hoped this protest will come before those who may have power to order the removal of this nuisance. The Society seems to be making way, and can boast of a great deal of cordial support from people whose names have weight in the world both of art and politics.

ALL SAINTS' CHURCH, PADDINGTON.—The interior of this church, which stands at the east end of the garden, Norfolk-square, was wholly burned out on the night of Thursday last week. We read in Mackeson's "Guide" that it was designed, in eleventh-century Gothic style, by Mr. Clutton, consecrated in 1847, and remodelled by Mr. J. Brooks in 1873, when the gallery was removed and a chancel added. The east window was by Messrs. Clayton & Bell, the west by Mr. Hardman; another, in the north aisle, by Mr. Mayer; the organ by Hill (1873). Despite the aid of six steam-engines, with three hydrants, the interior was consumed within one hour.

\* The object of these notes is to point out anything in the contents of the current magazines which is of special interest to our readers, with occasional brief criticisms on the views expressed in such articles. When a magazine which has been sent to us is not noticed, it is because that number contains nothing that it is within our province to comment upon.



THE ARCHITECTURAL ASSOCIATION:  
ANNUAL DINNER.

The annual dinner of the Architectural Association was held at the Holborn Restaurant on the 31st ult., Mr. E. W. Mountford, the President, in the chair.

After the toast of "The Queen and Royal Family" had been duly honoured,

The Chairman proposed "The Royal Institute of British Architects," which, he said, had done a good deal for the Association, especially in assisting them with a money grant to carry through their scheme of education. The Association had not done much for the Institute, though no doubt they did the Institute a service by training those who afterwards joined its ranks. With the toast he had much pleasure in coupling the name of Mr. Arthur Cates.

Mr. Cates, in replying, said the cordial relations which existed between the Institute and the Association were of great mutual advantage to each body, and of still greater advantage to the profession at large. The Association was a London body, just as the Institute used to be, but in recent times the Institute had endeavoured to bring into close contact and familiar intercourse with it the profession generally throughout the country. By means of the scheme known as the "Allied Societies" every professional society in the country of any repute was, he believed, affiliated to the Institute, though, unfortunately, all the members of those societies were not also members of the Institute, though he hoped the time was not far distant when they would be. One exceedingly important question which had arisen out of that combination was that relating to the utilisation for the purposes of education of the facilities for education which existed in all the large towns and in many of the smaller ones. He referred particularly to schools of art, by means of which young architects in the provinces might be able to obtain an education equal to that to be had in London. Mr. Cates then referred to the Gresham commission, which had recently been held to consider the question of the establishment of a teaching university in London, and to the fact that the Institute of Architects had not only given evidence before the commission, but that it had been decided that the Institute should appoint one of its members to sit upon the Senate which should control the university. He also referred to some articles on the subject of the education of the architect, which had appeared in a high-class engineering magazine of New York; the conclusion arrived at by one of the writers, an architect, by a comparison of the French, American, and English systems, was that a system of standard examinations by a central body with authority, following on a course of study under independent educating institutions in which variety of instruction may be permitted, was the most promising method of architectural education, and it was this system which had been adopted by the Institute. The Institute would next year fully establish the Progressive Examinations, which would really afford a complete course of education, and he hoped that they might go a step further, and at no distant future establish an "Honours Examination," which might be rendered an object of ambition by attaching to it some valuable prize—something equivalent to the Grand Prix de Rome of the Ecole des Beaux-Arts.

Mr. E. T. Hall next briefly proposed the toast of the evening, "The Architectural Association," and in doing so made reference to the excellent work which the Association is doing. The Association represented the youth, energy, and zeal of the profession, which had the future before it. The mutual exchange of ideas which the Association promoted was highly beneficial, and he hoped that it would continue to prosper in its work.

The Chairman, in replying, said that Mr. Cates had stated that the Association was a London body; but he might say that they had members all over the world. Their Association must have doubled its membership during the last twenty years, and they had now 1,200 paying members. As many of them knew, they were trying to obtain new premises, and when they found them, as they almost thought they had, they would be able to have a library and a common room, which they needed very much.

Mr. Banister F. Fletcher, junior hon. sec., proposed "The Instructors and Studio Visitors," coupled with the names of Mr. A. Beresford Pite and Mr. Holmes.

Mr. Beresford Pite, in reply, said that unless the instructors and studio visitors had a proper sense of their own importance, individually and

collectively, the Architectural Association, as a teaching body, and the Institute as an examining body, would fall below the high standard which had been spoken of that evening. It was necessary that an instructor should not only have some one to instruct, but that he should have something to teach, and he (the speaker) thought he might be grateful that the chairman of the Examination Board, Mr. Cates, had instructed the instructors what they should instruct in. The whole question was a complicated and a difficult one. There were so many vacancies in the minds of the ordinary individual which had to be filled up before he could be called an architect, that the position of instructor to the Architectural Association was an exceedingly difficult and an exceedingly painful one. After many years' reflection on the subject, he thought that the best course to pursue was to teach him nothing, but to leave him to teach himself, instructing him how to learn, for if they were to avoid academic pitfalls, they must get rid of the idea that architecture as architecture could be taught. There were many subjects which a young architect ought to be instructed in, but when he had been taught those he had not been taught architecture. In his opinion the interests of architecture as an art would be best served by changing the name of the Institute examinations, and, instead of calling it an examination in architecture, to call it an examination for qualifying for membership of the Institute. They would not then be sailing under false colours, and there would be quite sufficient enthusiasm excited amongst members of the profession to induce them to join the Institute under those conditions. The present examination was not an examination in architecture, and never would be, until they could arrive, one and all, at a definite standard of examination in design. The whole question of a proper architectural education depended on design, but who could examine in design? He would very much like to ask the President elect of the Institute to tell them why the Parthenon was beautiful; it was beautiful; but why, was a question which ought to be included in the examination which the Institute conducted. A list of technicalities respecting that building was not a satisfactory answer to that question, for they were concerned in that serious and important matter of the production of architects. In the matter of instruction in design, what they had to do was to cultivate the qualities of the student, rather than his quantities, and if they attempted to cram him with quantities of information they would not be doing much good. He was rather forced to the conclusion that it is impossible to tell at the outset of a man's career whether he would be gifted with the definite perception of the beautiful and the capacity to produce it in art; they were beset with that difficulty, and the whole course of instruction had to be influenced by that consideration, and in that fact was to be found the danger of examinations in architecture which might exclude men who, ere long, might develop the gift.

Mr. Holmes having also replied,

Mr. F. T. W. Goldsmith, senior hon. sec., proposed the toast of "The Visitors," coupled with the names of Mr. F. C. Penrose and Mr. Walter Crane, both of whom replied.

Mr. Crane, in the course of a characteristic speech, said that in the present age far more serious requirements were placed upon architects than upon any other artist. If they were to write a receipt for the manufacture of a modern architect, it would show that he should consist of six parts engineering, three parts sanitation, two parts business, and perhaps one part might be left for art. When they considered how much the age was affected by the landscape of our towns, they could not consider it of too much importance what the eye of the ordinary citizen rested upon, and the architectural education of the ordinary citizen rested with them. He therefore hoped that the residential flat was not the last word in street architecture.

Other toasts were, "The President Elect," proposed by Mr. W. D. Caroe, and responded to by Mr. E. W. Mountford, and "The Retiring Officers," proposed by Mr. F. R. Farrow, and replied to by Mr. E. S. Gale.

**BUILDING TRADE WAGES AT NEW ORLEANS.**  
—According to a recent report of the British Consul at New Orleans upon the trade of that town and district, the rates of wages paid per day are as follows: Bricklayers, 16s.; cabinet-makers, 12s. to 16s.; carpenters (house), 10s.; carpenters (ship), 12s.; copper-smiths, 12s. to 15s.; gasfitters, 10s.; painters, 11s.; paperhangers, 12s.; pipe-layers, 10s.; plumbers, 12s.; stonemasons, 10s.; labourers, 6s.

## THE LONDON COUNTY COUNCIL.

The usual weekly meeting of the London County Council was held on Tuesday at the County Hall, Spring-gardens, Sir John Hutton presiding.

*Widening of Wellington-street and the Strand.*  
—The debate on the adjourned report of the Improvements Committee, dealing with the proposed widening of Wellington-street at its junction with the southern side of the Strand, was resumed. The following is the amended recommendation of the Committee:—"That, subject to an estimate being submitted to the Council by the Finance Committee, as required by the statute, the Council do accept the offer of the Duchy of Lancaster to sell to the Council for 32,000*l.*, and upon the conditions set out in the report of the Improvements Committee, the reversion to the freehold of the property required for widening Wellington-street and the Strand, with a view to carrying out the improvement; and that the solicitor be instructed to prepare the necessary agreement with the duchy." To this Dr. Collins had proposed the following amendment, which was seconded by Mr. Costelloe:—"That after the word 'improvement' the following words be inserted—'on the understanding that the reduction of the price from 38,750*l.* to the agreed sum of 32,000*l.* is made in lieu of a contribution by the duchy in respect of betterment.'"

This was carried, and Mr. Cornwall proposed a further amendment as follows:—"That the following words be added—'provided that the arrangement shall be subject to the Strand District Board agreeing to contribute one-fourth of the purchase money.'"

He contended that in no way could this improvement be called a metropolitan one, and said it was, therefore, manifestly unfair to ask the Council to pay the whole of the cost.

Mr. Torrance seconded the amendment. Mr. Emden said that the improvement would be one for the benefit of the whole Metropolis, and, therefore, the Strand Board could not be fairly asked or expected to contribute to the cost.

Upon a show of hands the amendment was carried by a majority of one. Upon a division, there were for the amendment fifty-one, against forty. After some further discussion the motion, as amended, was carried.

*Bethnal Green Poor Land.*—The Parks and Open Spaces Committee were authorised to incur an expenditure not exceeding 2,250*l.* for laying out Bethnal Green Gardens (Poor's Land section).

*Electric Light for two Bridges.*—The Highways Committee's recommendation that the generating station for lighting the Embankment and the Waterloo and Westminster Bridges be constructed by the Works Committee was agreed to.

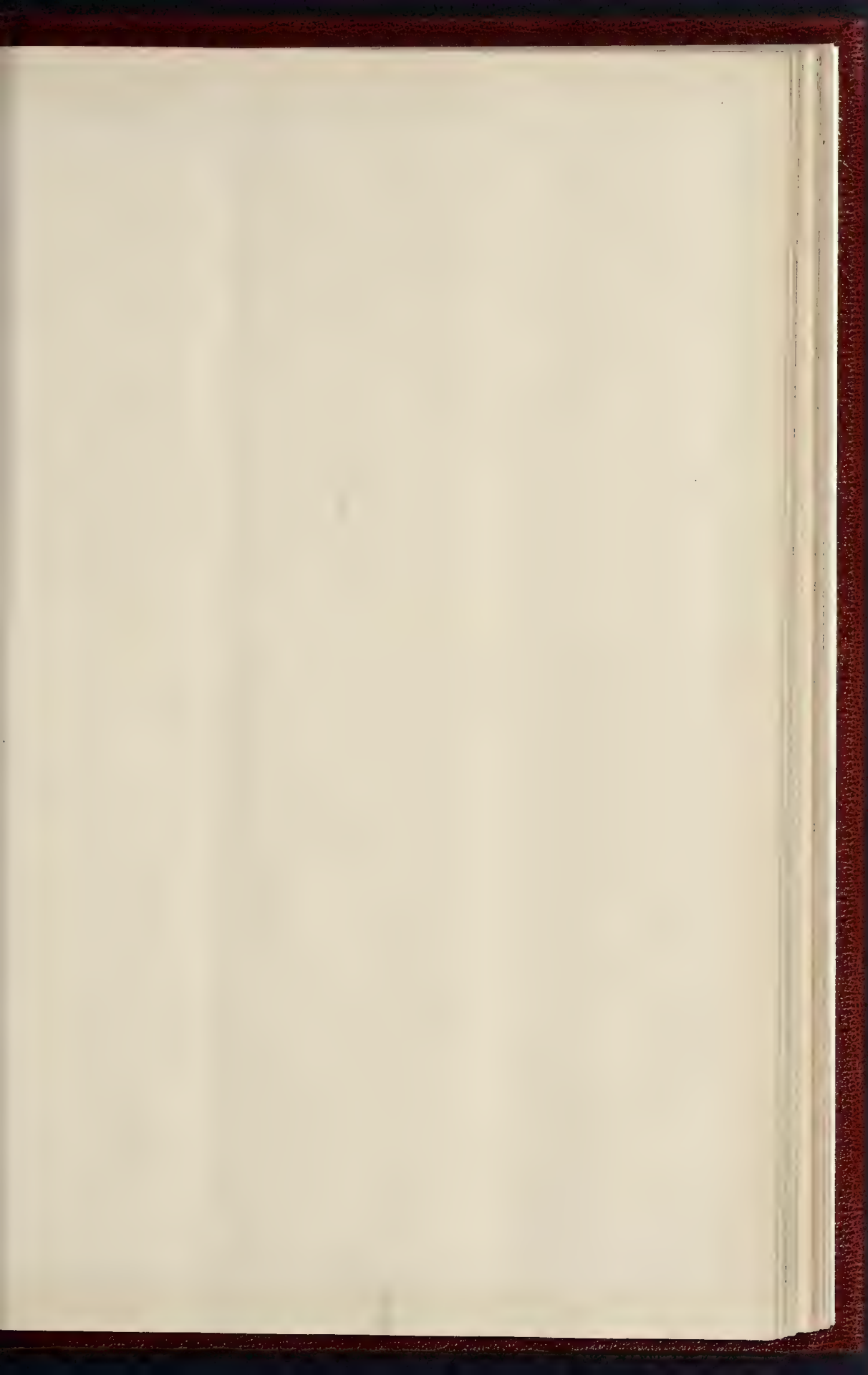
*Railway Stations in the County of London.*—

The report of the same Committee contained the following paragraph:—

"On 6th June last we submitted a recommendation for a reference to the Parliamentary Committee to consider the expediency of applying for some amendment of the Standing Orders of Parliament to place upon railway companies bringing in Bills the duty of depositing plans and sections of any stations proposed to be constructed or re-constructed. This recommendation was, however, referred back to us; and on the same day we were, on the recommendation of the Building Act Committee, instructed to consider and report whether any further powers of regulation and control with regard to the construction of railway stations should be sought by the Council. We have given very careful consideration to the subject of the reference, and under the authority given to us by the Council on June 21, 1892, have caused an inspection to be made of the railway stations in the County of London, which inspection has, however, in some instances been incomplete, as the companies are under no obligation to afford facilities for the purpose. From the reports made to us it appears evident, that many of the stations require considerable alteration to meet the requirements of the public; and we are of opinion that the Council should have some efficient control over the construction and reconstruction of railway stations, and should also have statutory power to inspect railway stations, and that railway companies should be required to give proper facilities for such inspection. We think that the Council should promote legislation for the following purposes—(a) to give the Council, for the purpose of enabling it to make representations under the Railway and Canal Traffic Act, 1888, power to inspect from time to time the stations of every railway company in the County of London; (b) to require each railway company, before constructing a new station or re-constructing or altering an existing station in the County of London, to submit plans of the proposed









THE BUILDER, JUNE 9, 1894.







MONUMENT TO LESSING, BERLIN.—PROFESSOR OTTO LESSING, SCULPTOR





either carbolic acid, chloride of lime, or sulphurous acid, so as to make the air from the pipes as inoffensive as possible. He should like to ask who was responsible for the maintenance of the shafts, because if owners of property were responsible there might be a good deal of danger attaching to the system. If the Local Authority were responsible they would have the right to enter the premises and see that the pipes were maintained in a perfectly safe condition. While on the subject of sewer ventilation he must say he did not agree with the reasoning of Mr. Godfrey that because a house contributed to the volume of sewage, *ergo*, it should assist to ventilate the sewers. The smell from the volume of sewage from a house was very little; the foul smell came from the public sewers. So long as they went on constructing sewers of soft bricks they would perpetuate that nuisance. The day would come when brick sewers would be constructed of impervious and glazed bricks with as much care as pipe sewers are made.

Mr. Low (Hampstead) asked whether there had been any complaints from residents living on the higher levels of smells from the low levels. He found in his district the pipes had caused a nuisance to people living on the higher levels. He agreed with Mr. Meade that traps could not be done away with, but thought they might be improved by proper flushing. During the night the traps became small cesspools, giving off an offensive odour, and when flushed in the morning the smell from them came out of the first ventilator. He thought they should not only have a syphon, but some means of automatic flushing, so that the trap might be properly flushed.

Mr. Marston (Sutton Coldfield) asked whether the pipes were insisted upon in the case of all new buildings, or only in the case of buildings erected up to the street-line? If they were insisted upon with houses set back, were they fixed upon the house itself or the entrance nearest to the public-road?

Mr. Read (Gloucester) said he was apparently in a minority with regard to sewer ventilation. He might point out that the intercepting trap used three inches of the fall of the drain, which could very rarely be allowed. The experiments made by the Sanitary Institute with regard to flushing showed that the intercepting trap was responsible for retaining from 21 to 36 per cent. of the solid matter in the trap. If that happened in an intercepting trap laid in a laboratory manner, from 240 experiments above ground, what happened in the thousands of drains of less gradient underground? He held that intercepting traps created the very nuisance they were intended to prevent.

The President said that given sufficient fall for the intercepting trap, what objection had Mr. Read to ventilating the sewer by the trap?

Mr. Read said he thought Mr. Garrett's use of the pipe laid from the sewer side of the disconnecting trap was the only way in which it should be used.

Mr. Meade (Hornsey) said that as he was responsible to a certain extent for the experiments of the Sanitary Institute, he might answer Mr. Read's objection. The experiments were not made for testing intercepting traps; they were made for the purpose of ascertaining whether the 2-gallon flush was sufficient for London water-closets.

Mr. Radford (Putney) said he did not think they had any right to throw the ventilation of the sewers on private owners of property; while the local authority disposed of the sewage, they ought also to attend to the ventilation of the sewers.

The President, in closing the discussion, remarked that the principal point touched upon was the vexed question of sewer ventilation. He had his own opinions upon the subject, and although they did not coincide with the majority, he was open to conviction if they could convince him he was wrong. He must say that Mr. Garrett's method of getting over one of the most serious difficulties by compelling owners to fix shafts on the sewer side of the trap was a long way ahead of the practice of any other town. If they could insist upon owners affixing these shafts, it would do away with a great deal of the objection to intercepting traps.

The vote of thanks having been accorded to Mr. Garrett, that gentleman replied to the points raised in the discussion. He said he could not lay claim to having introduced the system of sewer ventilation. He believed Dr. Karkeck, Medical Officer of Torquay, was the introducer of the system. They had no power to compel the fixing of shafts; but where they were not shown

the plans were sent back. They were going to the Local Government Board for compulsory powers, and whether they succeeded or not they would have a strong case in Torquay.

The members attending the meeting were entertained to luncheon by the Mayor; after which the Harbour Engineering Works, the Princess Gardens, the Waterworks, the Observatory, and other places of interest were visited. At the Waterworks Mr. T. S. Weeks, engineer, read a brief paper on the method of detecting waste of water at Torquay, and at the Chapel Hill Meteorological Observatory Mr. A. Chandler contributed a brief paper, descriptive of the position of the building and the instruments contained therein. After a drive the members returned to Torquay for tea, provided by the Mayor.

#### ENGINEERING SOCIETIES.

INSTITUTION OF CIVIL ENGINEERS.—The annual general meeting of the Institution of Civil Engineers to consider the report of the outgoing Council, with the statement of accounts, and to elect the Council and officers for the ensuing session, was held on the 29th ult. Mr. Alfred Giles, the President, being in the chair. The tabular statement of the transfers, elections, deaths, and resignations during the year showed an effective increase of 188 on the previous total of 5,371—or at the rate of 3½ per cent. per annum—while as regards the students, the decrease was 28. The gross numbers on the books on March 31 in 1893 and in 1894 were 6,397 and 6,557 respectively. . . . A review of the work of the past session was given, from which it appeared that nineteen papers had been read and discussed at the ordinary meetings, treating of separate and clearly defined branches of engineering—municipal, hydraulic, mechanical, mining and electrical, and also referring to naval architecture. For several of the papers detailed premiums had been awarded to Messrs. Clerke, Kreuter, Vernon-Harcourt, Partiot, Greathead, Fox, Parker, Hunt, Redwood, Commans, and Colquhoun. The papers selected for printing without being read had been numerous and varied, and had ranged over the whole field of modern engineering. Mention was made of several representative memoirs in the various branches, not that they merited greater recognition than the others, but that they served to support the quality of catholicity claimed for the Institution. Premiums for papers in this category had been awarded to Messrs. Donkin, Lowcock, Marks, Tanabe, Ewart, and Moncrieff. The second of the "James Forrest" lectures had been delivered by Dr. John Hopkinson, F.R.S., M.Inst.C.E., his theme being "The Relation of Mathematics to Engineering." This recondite subject had been presented to a large audience, which testified in a marked manner its appreciation of the lecture. Several supplemental meetings for students had been held. The papers read afforded evidence of having been carefully prepared, and three of them were considered sufficiently good to merit the distinction of being printed in the minutes of proceedings. The proceedings of the local Association of Students at Manchester, Glasgow, Birmingham, and Newcastle-on-Tyne, had been highly satisfactory, and the Council was glad to report that a fifth local Association had been formed at Leeds. For papers read by students at the Institution, and before the local Associations, the Council had made the following awards:—The Miller Scholarship (tenable for two years) to Mr. L. H. Appleby; and Miller prizes to Messrs. A. R. Gale, W. Beer, W. G. Wales, H. T. White, P. J. Tucker, H. N. Allott, A. Watson, W. O. Leitch, and T. H. Watt. At the Engineering Congress at Chicago, alluded to in the last report, the Institution had been represented by Sir Benjamin Baker, K.C.M.G. An address, thanking the Institution for its action in the matter, had been subsequently received from the Executive Committee of the Congress. The Council was of opinion that to preserve and strengthen the cordial relation which subsisted between the engineers of Great Britain and of the United States was a high object, for the attainment of which in the present case the thanks of the Institution were due to its delegate. The laborious work of preparing for press the Library Catalogue had been completed. A large portion of the matter was already in print. The sheets of the first volume had been struck off, and a bound copy was laid on the table for the inspection of the members. In conclusion, the Council had devoted much attention to the question of rebuilding the premises. A

decision had been arrived at to utilise the sites of Nos. 24, 25, and 26, Great George-street, and designs for a new building had been prepared by Mr. Charles Barry, F.R.I.B.A. It was hoped that the work might be commenced early in the forthcoming recess. The report having been adopted, cordial votes of thanks were passed to the President, the Vice-Presidents, and the other members of Council, for their zeal on behalf of the Institution; to the auditors for the time and trouble they had bestowed in verifying the accounts; to the secretaries and staff for their services; and to the scrutineers of the ballot. The ballot for Council resulted in the election of Sir Robert Rawlinson, K.C.B., as President; of Sir B. Baker, K.C.M.G., Mr. J. W. Barry, Mr. W. H. Preece, C.B., and Sir Douglas Fox as Vice-Presidents; and of Dr. W. Anderson, A. R. Binnie, W. R. Galbraith, J. H. Greathead, Sir Chas. A. Hartley, K.C.M.G., J. C. Hawkshaw, C. Hawkley, Dr. Alex. B. W. Kennedy, Sir Bradford Leslie, K.C.I.E., J. Mansergh, Sir Guilford Molesworth, K.C.I.E., Sir E. J. Reed, K.C.B., W. Shelford, F. W. Webb, and Dr. W. H. White, C.B., as other members of Council. The session was then adjourned to the second Tuesday in November at 8 p.m.

SOCIETY OF ENGINEERS.—On Tuesday a visit was paid by the Society of Engineers to the South Metropolitan Gas Works, Old Kent-road, S.E. Among those present were Mr. George A. Goodwin (President), Mr. H. Adams, Mr. W. A. McIntosh Valon, J.P., Mr. J. W. Wilson, jun. (Past Presidents), Mr. G. A. Pryce Cuxson (Secretary), and others. The Old Kent-road Works are in two separate portions—the old and the new. No extensions have been carried out here since the amalgamation with the Phoenix Company, as since that time new works have been completed at East Greenwich, which have been built and designed for the purpose of meeting the increasing demand for gas in the company's district. The other works of the company (five in number) are each situated on the river, and as a consequence coals are delivered into those works at cheaper rates than at Old Kent-road, where all the coal has to pass along the Surrey Canal. The position of the Old Kent-road Works is favourable for the distribution of gas and also for the sale of coke. The maximum manufacturing capacity is 9,000,000 cubic feet per day, equal to 900 tons of coal; producing 400 tons of coke for sale, 9,000 gallons of tar and 27,000 gallons of ammoniacal liquor; these figures represent about one-fourth of the total maximum daily production of the company.

THE COMMISSION OF SEWERS.—At a meeting of this commission held on Tuesday last the principal questions considered were the appointment of a successor to the late Colonel Haywood as City Engineer, and the question of building public baths and wash-houses within the City. The special committee appointed in April last reported in favour of appointing as successor to the late City Engineer, Mr. Ross, who for many years had been the chief assistant to Colonel Haywood, his salary to be increased from 650*l.* to 800*l.* a year, but Mr. Deputy Scott opposed the motion on the ground that, in order that the office should be worthily filled, an engineer already eminent in his profession should be appointed. They ought to appoint a man who would maintain the prestige of the City and be able to meet any other engineer upon equal terms. Both Mr. Deputy Scott and Mr. H. T. Gordon, who seconded the amendment moved by Mr. Scott to refer the question back to the committee, admitted that Mr. Ross was thoroughly qualified for routine work and was the best man for the place they had in the office, but thought he fell short of the competence of the late engineer, whose successor should be an expert in land values and be well acquainted with all matters of architecture. Mr. W. H. Pannell supported the recommendation of the Committee. It was impossible to secure a man who was an expert in everything, and he pointed out that even in the lifetime of the late engineer they had frequently to go outside the department for advice on special subjects. After a speech from Mr. Alderman Green, in which it was pointed out that Mr. Ross had been twenty-two years in the service of the Commission, a show of hands was taken when only six members voted for the amendment. The recommendation of the Committee was then agreed to *nem. con.* On the question of erecting swimming-baths, the solicitor having reported that the Commission had no power to expend money for the purpose, Mr. Banister Fletcher submitted a report of the Sanitary Committee, expressing the opinion that the erection of the baths was eminently desirable, and recommending that the report be referred back to the Committee to consider the steps to be taken to obtain the necessary powers to carry out the project. The report was agreed to.



## Illustrations.

THE NEW LESSING MONUMENT,  
BERLIN.

**T**HE new Lessing monument, unveiled last October with all due ceremony, stands on a site on the outside edge of the "Thiergarten," where, backed by foliage and slightly raised above the road level on a neatly-laid-out piece of ground, it is seen to great advantage.

The statue, about 10 ft. high, is in white marble, and shows the poet in the dress of his time. The pedestal is of red Swedish granite, and on each of its four sides are gilt plaques, on the front one of which is the name of Lessing, and on the three others medallion portraits of his friends Nicholas, Kleist, and Mendelssohn (grandfather of the composer). At the foot of the pedestal we see on the front side a bronze figure symbolising "Toleration," on the rear side a figure representing "Criticism," the former resting his arm on a slate on which the last lines of the famous story of the three rings ("Nathan der Weise," act iii.) are engraved. On either side basins have been placed into which water pours. A low railing of rich design forms the inner enclosure. Professor Otto Lessing (a descendant of the poet), well known as a sculptor of repute, is the artist.

The illustration is from a photograph taken by C. C. Schirm, of Berlin.

BATH PUMP-ROOM EXTENSION  
DESIGNS:

## INTERIOR AND EXTERIOR VIEWS.

THE two illustrations given here, and now hung in the Royal Academy, were in fact two drawings which formed part of the set of competition designs by Mr. J. M. Brydon which obtained the first premium in the Pump-room Competition. We photo-lithographed them at the time when we published the other competition drawings, but withheld them from publication at the request of the author, as he did not wish them to appear until they had been hung at the Academy.

We have already published the elevation, section, and plan of the design (*Builder*, March 10, 1894), and have commented on these drawings in the course of articles on Architecture at the Royal Academy. It only remains to mention here that the original design will be actually carried out with some modifications, the principal of which are that the Roman Bath will be roofed over in one span; that the apartments of the new buildings (except the museum) will now all be on one floor; and except the promenade, the buildings will be kept down to one story in height.

VILLAGE CLUB AND RESIDENCES,  
WARNHAM, SUSSEX.

THIS illustration, from a drawing now in the Royal Academy Exhibition, shows, in addition to two detached residences, the village club and hall, erected for Mr. Henry Harben, J.P., of Warnham and Hampstead. The club building, which has been presented to the village by Mr. Harben, who has provided an endowment for its maintenance, contains library, smoking room, caretaker's apartments, a public hall, 51 ft. 6 in. by 24 ft., and ample retiring-rooms for artists. The residences were erected to supply a long-felt want in the village.

The land upon which the buildings stand was presented by Mr. Charles Lucas, of Warnham Court.

Mr. Joseph Potter, builder, of Horsham, erected the buildings under the supervision of the architects, Messrs. Batterbury & Huxley, of London.

**ARCHITECTURAL ASSOCIATION.**—In reference to our remarks on the small attendance at Mr. Stirling Lee's lecture on "Sculpture in relation to Architecture," we have been informed that every effort was made on the part of the secretaries of the Association to call attention to the lecture. Unfortunately Mr. Lee's promise to give the lecture was only received a few days previous to the date fixed for its delivery, and after the publication of "A. A. Notes" for May, so that there was no opportunity for announcing it in the pages of the regular organ of the Association, otherwise there would probably have been a better attendance.

## COMPETITIONS.

**ST. MARYLEBONE PUBLIC BATHS AND WASH-HOUSES.**—The Baths Commissioners have invited designs in competition for the alteration or reconstruction of the baths and wash-houses in the Marylebone-road. The commissioners have appointed Mr. Charles Barry, F.S.A., to act as their assessor in adjudicating on the designs. Three premiums are offered of 100*l.*, 60*l.*, and 40*l.*, for the first, second, and third designs chosen.

**BOARD SCHOOL, ROCHDALE.**—The Rochdale School Board, aided by their assessor, Mr. James Murgatroyd, of Manchester, have chosen the competitive designs submitted by Messrs. Woodhouse & Willoughby for the Castlemere Board School. The cost is estimated at 5,000*l.*, and the school will accommodate 660 scholars.

**WORKHOUSE INFIRMARY, SELLY OAK, KING'S NORTON.**—The result of the competition for a Workhouse Infirmary at Selly Oak, King's Norton, has just been made known. The 1st premiated design, "Practical," was by Mr. Daniel Arkell, Temple Row West, Birmingham; 2nd, "Comfort for the Poor," by Messrs. Essex, Nicol, and Goodman, Newhall-street, Birmingham, and the 3rd, "Hygiene," was by Mr. Henry E. Lavender, Midland Chambers, Walsall.

**SEWAGE SCHEME, GLOSSOP.**—A special meeting of the Glossop Town Council was held on the 30 ult., to receive the report of the sub-committee on the sewage scheme. Thirteen schemes had been sent in, the Council having offered a premium of 100*l.* for the best scheme, and 50*l.* for the next. It was unanimously resolved that the first premium of 100*l.* should be awarded to Messrs. Lomax & Lomax, Grosvenor Chambers, Deansgate, Manchester, who had adopted the *nom de plume* of "Valves"; and that the second premium of 50*l.* should be given to Mr. W. H. Radford, of Nottingham, who had competed under the motto of "Gravitation." Councillor Barnes said the cost of the scheme, roughly speaking, was estimated at 15*s.* to 25*s.* per head of the population.

## ARCHITECTURAL SOCIETIES.

**EDINBURGH ARCHITECTURAL ASSOCIATION.**—The members of the Edinburgh Architectural Association and friends, to the number of about forty, had their annual excursion on the 2nd inst. to Culross and the district. A start was made from the Waverley Station at 9.15 a.m. for Dunfermline, where brakes were in waiting to take the party to Culross. Arrived at Culross, a visit was first paid to the ancient Abbey Church and the fragments of the adjoining monastic buildings, the history of which goes back to 1217, when the Abbey was founded by Malcolm, Earl of Fife. The original plan and the existing details of the church and monastery, including the tower, the fragments of the cloisters, and the entrance to the Chapter-house engaged much interest and conjecture, and the several tombs of the family of the Bruces of Carnock also attracted attention. After having visited the Abbey House, and noted the points of resemblance in its architecture to that of the contemporary Heriot's Hospital, the members explored the narrow, winding, cobblestoned streets lined as they are by specimens of the Scottish domestic architecture of the sixteenth, seventeenth, and eighteenth centuries. Among the buildings specially examined were the venerable town hall in the Sandhaven and the edifice known as "The Palace," built by Sir George Bruce, of Carnock, in which part of the old painted ceilings is still intact, although in danger of being destroyed by weather and neglect. Lunch was partaken of in the "Dundonald Arms," and, under the guidance of Canon Bruce, who met the party on their arrival, Dunfermline Castle, standing on the supposed site of Macduff's Castle, with its seaward outlook, its fine grounds, and its valuable museum and objects of art, maintained under the will of the late Mrs. Erskine Sharpe, was next visited. The drive was continued to Kincardine, through the woods of Blair and Sands, and after a brief survey of the dismantled old seventeenth-century church behind the town, and the ruined fortalice of Tulliallan Castle, the party, by the permission of the Dowager Marchioness of Lansdowne, were permitted to proceed through the Tulliallan grounds and to visit the house, returning by the high road to Culross, and thence to Dunfermline. The arrangements of the excursion were in the hands of Mr. Fairbairn, the secretary, and the leaders of the day were Mr. David Macgibbon and Mr. James Bruce.

## ARCHÆOLOGICAL SOCIETIES.

**THE NEWCASTLE SOCIETY OF ANTIQUARIES.**—On the 30th ult. a monthly meeting of the Newcastle Society of Antiquaries was held in the Castle, Newcastle. Mr. John Philipson, J.P., presided. Mr. S. Thorpe said he wished to call the attention of the Society to the alterations going on at St. Andrew's Church, Newcastle. It appeared that, in opening out the Holy Trinity chantry, they had come upon the tomb of Sir Aymer de Athol. He had seen it that day, and heard that it was proposed to lower the floor of the chantry to the level of the floor of the church. Now the church floor was already about a foot higher than it was originally, and if they were now to lower the floor, he thought it would spoil the effect altogether, and besides, it would disturb the tombstones that were now laid. It would be a pity to do so. It was also suggested that a layer of concrete should be laid over the whole. The Secretary (Mr. Blair) thought some of the grave stones found were most interesting. Mr. Knowlson said the excavations revealed several tombstones, including that of Sir Aymer de Athol. If any other member of the Society was interested in the matter, he would be very glad to measure and indicate the position of the stones, and to record the inscriptions. He thought that what had been said about moving the stones or covering them up again was a mistake on the part of Mr. Thorpe. There was no Vandalism, he imagined, contemplated. Mr. William Vincent, one of the churchwardens of St. Andrews, said that Mr. Thorpe had been misinformed. They had made special arrangements with Mr. Hicks, architect, to the effect that everything of antiquarian interest should be taken the greatest care of. A "Note on the Lanchester Altar to Garmagabhis," by Mr. F. J. Haverfield, F.S.A., was read by the secretary. The Rev. C. E. Adamson read a paper on "John Dagnia, the Italian Glassmaker, of South Shields who died in 1743." Votes of thanks were passed to the contributors of the papers, and the proceedings shortly afterwards concluded.

## Correspondence.

To the Editor of THE BUILDER.

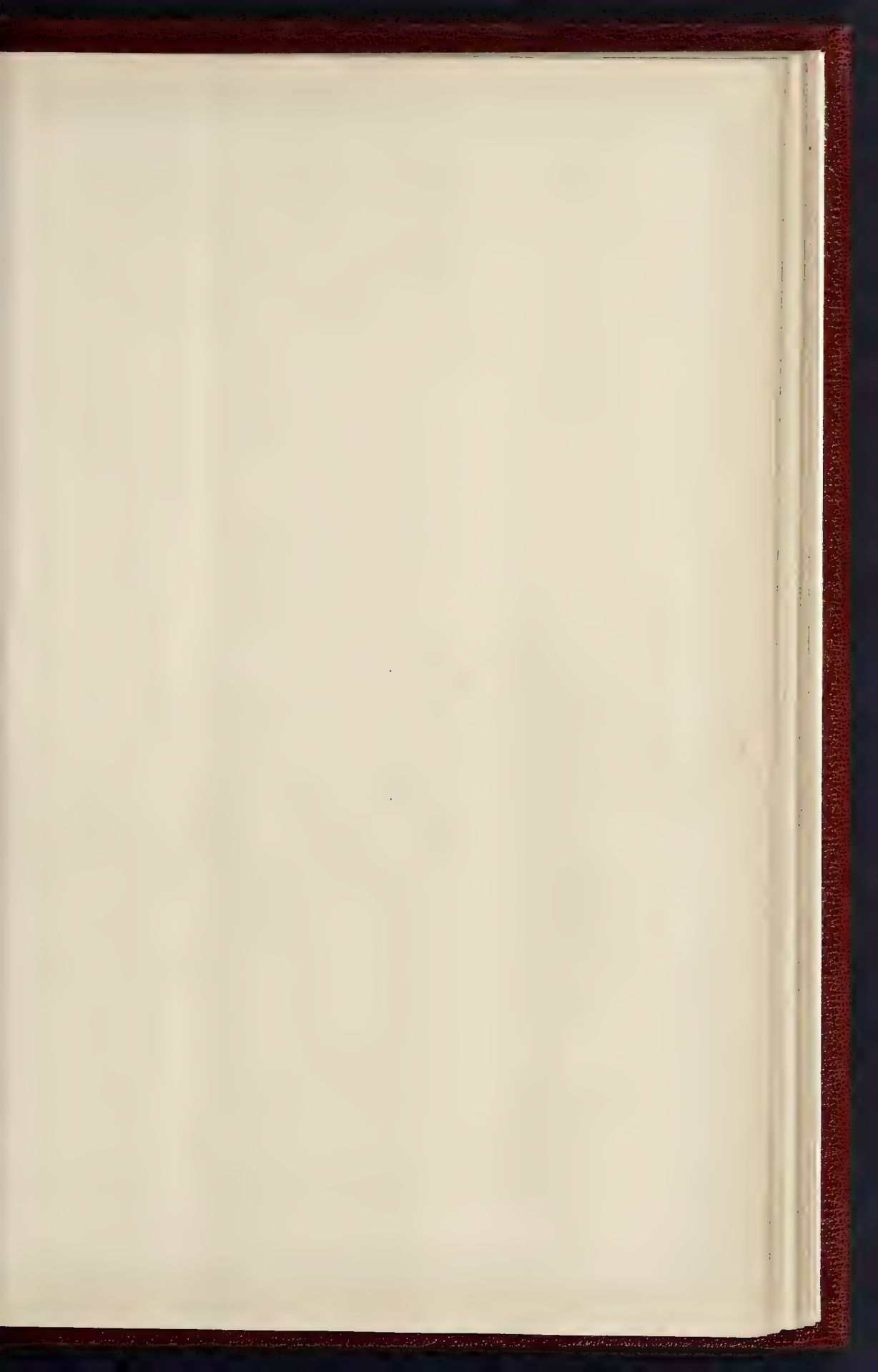
THE HEATING AND VENTILATION OF  
THE HOUSES OF PARLIAMENT.

SIR,—It appears hopeless to expect Mr. Keith can support by argument the faith which is in him. To range over two continents for statements which prove nothing, and then wind up two columns of your valuable space with a partial quotation from my first letter, in order to draw the inference he is pleased to draw from the mutilated paragraph "as absurdity," is scarcely a method of discussion which will enhance his reputation; because anyone with the most elementary knowledge of ventilation, who reads what I wrote, will realise that the context of the words quoted requires as a preliminary that air is to be propelled into the apartment; and what I wish to make clear is, that force thereby, primarily yet continuously, applied and properly directed, will cause the air of the apartment to quickly pass away, even after being vitiated, provided that the outlets, of suitable dimensions, are so situate and contrived that the air has exit, free from all other influence.

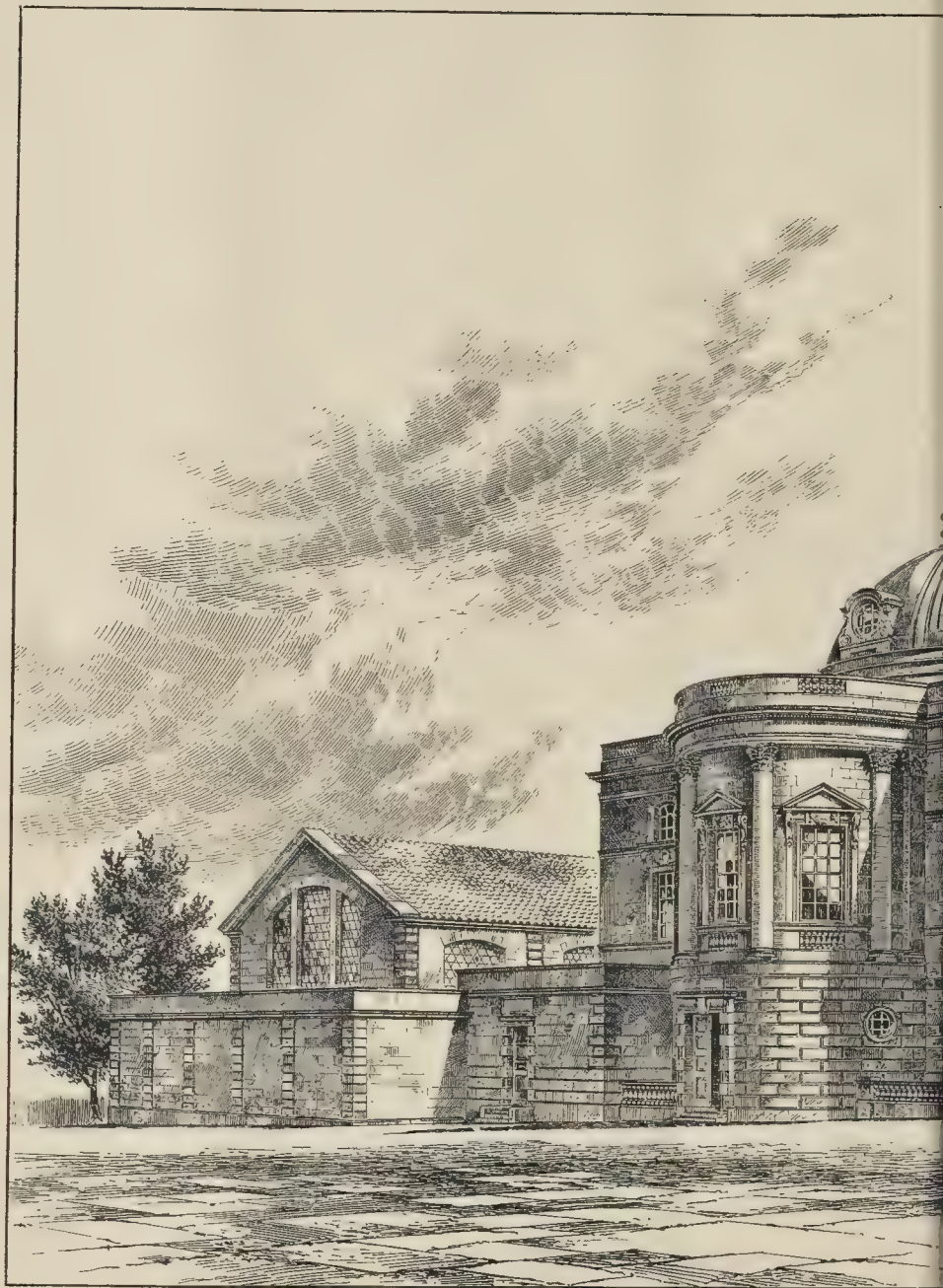
I have read and re-read Mr. Keith's report, but can find nothing whatever therein which explains whence the air is to come, additional to that which is forced in, or in what way it is to be cleansed, tempered, and humidified, or that he is prepared to guarantee its purity. Unless he can give reasonable answers to those questions it is evident that the methods he supports are unreliable.

It has been my endeavour to confine the discussion to the employment of a dual system of propulsion and extraction, because the question of its reasonableness lies at the root of the whole matter, and because the report which started this correspondence is so full of unscientific assertions and contradictions, to which, however, it is unnecessary to direct attention, seeing that Mr. Herbert Gladstone has stated in the House of Commons that it was unauthorised and would not be acted upon.

Mr. Keith is entirely in error in stating that the science of ventilation can be properly treated apart from architecture; for the very fact that buildings have to be erected for human occupation implies a necessity for ventilation; and as it is the province of architects to design such buildings, they, and they only, ought to be responsible for the proper supply of fresh air thereto. They are best able to realise in what manner it can be given and the vitiated air conveyed away; and just as much as they rely upon a mechanical engineer to supply boilers and piping in the most economical way where a given quantity of steam or hot water is required, to that extent ought they to rely upon the ventilating engineer to supply the appliances for giving the necessary







Royal Academy Exhibition, 1854

DESIGN FOR BATH PUMP ROOM E

EXT



PHOTO. L. THO. SPRACUE & CO. 4 & 5 EAST HARDING STREET FETTER LANE F.C.

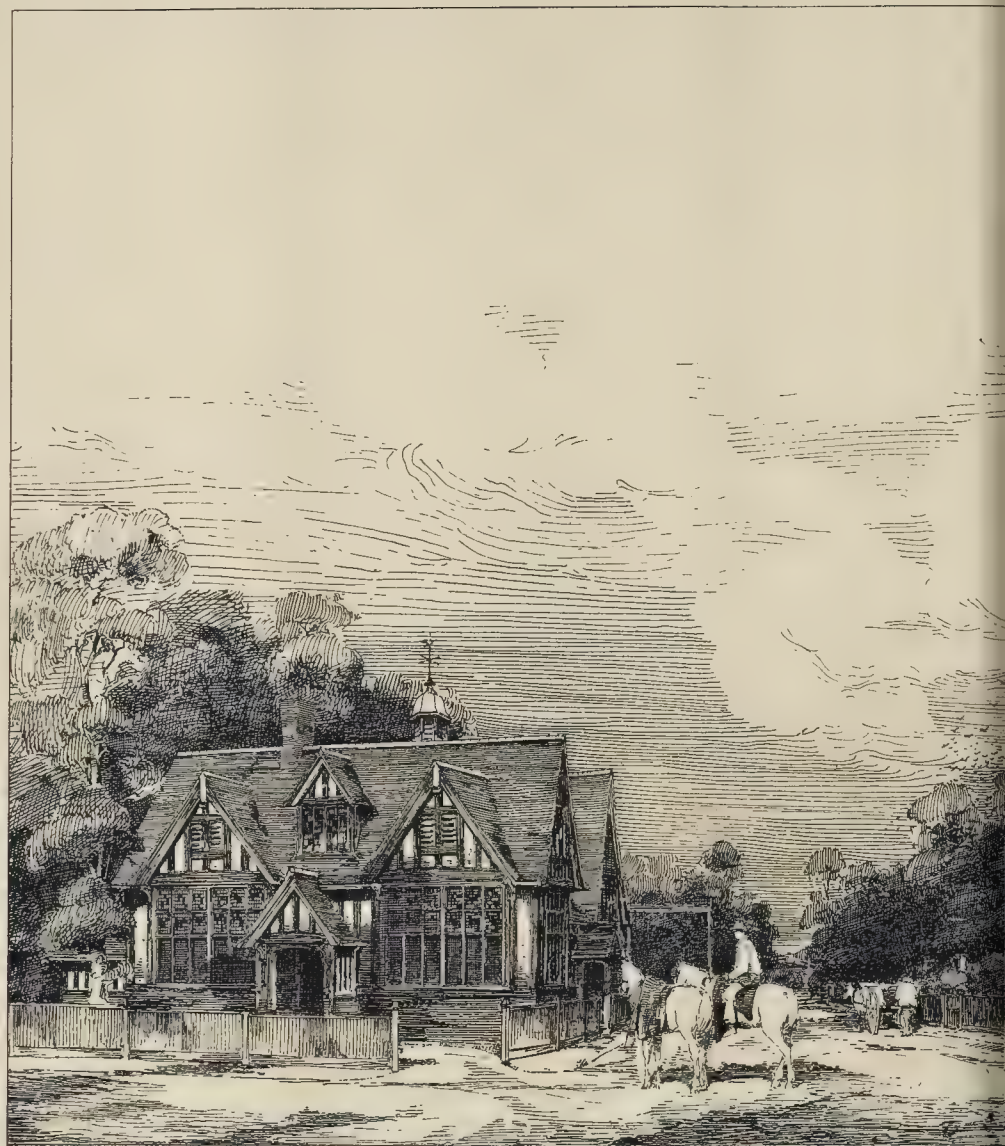
M. BRYDON, F.R.I.B.A., ARCHITECT.











Village Club and Two Res  
 Erected for H. Harben, Esq<sup>r</sup>.

*Battersea*



es . Warnham .  
Sussex .  
by Architects  
29 John Street, Bedford Row  
W.C.







umes of air, wholesomely cleansed and tempered. It is true that many large public buildings have been handed over to specialists, and also that failure in many such cases followed; so far architects have to be blamed, but I believe they are, as a body, pining to realise their proper position, and will not about a better state of things in less than a time.

Before leaving the subject I must refer to the graph in Mr. Keith's last letter in which, after adding to the House of Lords, he says he "thinks" it may be taken for granted that extraction rightly placed is infinitely better all round than propulsion. He undoubtedly takes far too much for granted, and in making such a statement shows he is five and thirty years at least behind the times.

By the kindness of Mr. Richard Peyton, of Birmingham, I am able to refer to a most interesting collection of documents bearing on ventilation; among them is a cutting from the *Builder* for July 2, 1859, describing a method of ventilation devised by Van Hecke, and employed at the hospital at the Asile Impérial de Visneet—also a long manuscript letter from Le Directeur de l'Administration Générale de l'Assistance Publique, dated 1st 21, 1860, which, after describing the various methods employed in some of the principal hospitals of Paris, states that several commissions of inquiry had been appointed to investigate the subject, and had reported at various times as to the relative merits of schemes in practical operation, and, in summing them up, the following statements were made, which I give in the original language for their force might be lessened by translation.

Les Commissions d'Examen ont, par leurs pressants travaux, constaté que la ventilation mécanique est préférable à la ventilation par différence de température. Et en effet la première a été réglée à volonté, augmentée ou diminuée avant les besoins, attendu qu'elle est produite par la force motrice qu'on peut développer indéfiniment, tandis que la seconde dépend d'un rapport de température qui varie avec le vent et la cheminée d'appel, rapport dont le point extrême est facilement atteint, et qui est influencé sensiblement par les variations atmosphériques. Elles ont reconnu encore, que la ventilation par propulsion l'emporte aussi sur la ventilation par aspiration, parce que la première assure, d'une manière plus régulière, le renouvellement général de toutes les couches d'air; par conséquent elle est lancée par l'ouverture des portes et des fenêtres, enfin parce que en hiver elle repousse l'air froid, il peut entrer par les fentes des fenêtres; tandis que la ventilation par aspiration fait appel aussi à l'air froid qui peut y passer, qu'à celui qui se trouve dans les canaux horizontaux.

After a few general observations the following tables are given:—

*Quantité de l'Air Renouvelé par Heure et par Malade.*

Aspiration.)	Système Duvioir (on ne tenant compte que de l'air qui arrive par les canaux)	30 mètres cubes.
Aspiration.)	Système Thomas	.. 30 "
Aspiration.)	Laurens	.. 90 "
Aspiration.)	Système Van Hecke	.. 97 "

*Dépense de Première Installation par Lit.*

Aspiration.)	Système Duvioir	.. 480 f.
Aspiration.)	Thomas et Laurens	.. 808 f.
Aspiration.)	Van Hecke	.. 246 f.

*Dépense Annuelle de Fonctionnement et Dentrée par Lit.*

Aspiration.)	Système Duvioir	.. 51 f.
Aspiration.)	Thomas et Laurens	.. 101 f.
Aspiration.)	Van Hecke	.. 28 f.

*ix de Revient pour l'Administration de l'Unité de Ventilation (8,700 mètres cube une fois donnés, à 1 mètre cube fourni par heure toute l'année).*

Système Duvioir	.. f. 336.
Thomas et Laurens	.. f. 176.
Van Hecke	.. f. 61.

In view of such a conclusive report in favour of filtration by propulsion, founded upon carefully conducted experiments, it may be asked, how is it that the system has not become universally recognised as the best and been generally adopted? This question I will venture to reply—viz., thirty forty years ago mechanical appliances were far from perfect, and the sanitary importance of frequent change of air was not thought to be so acting as by degrees it has been proved to be; and the appliances laid down in those days, of course of time, found to be imperfect as they were, and the system was deemed by those who did not understand the cases. Others, however, have continued to believe that the system itself is sound and valid, and have turned their attention to perfecting the appliances and methods of adaptation, so now, as I have previously stated, there are buildings, even of colossal size, efficiently ventilated by a system of propulsion, pure and simple, and this is so well recognised by those who have had practical experience of the system, that they are contented that in such buildings as the Houses of Parliament it is no use tinkering with a defective system, and they would rather see matters left as they are, until a radical change becomes a necessity, funds are forthcoming for the adoption of a system based on rational principles.

WILLIAM HENMAN, A.R.I.B.A.

SEWER AND DRAIN VENTILATION.

SIR.—Mr. West, in his paper upon the above subject, arrives at conclusions somewhat similar to those expressed by myself in a paper read before the International Congress of Hygiene, London, 1891, see vol. vii. of the "Proceedings," and also in a paper I read before the Association of Municipal and Sanitary Engineers in 1883, see vol. ix. of their "Proceedings."

Mr. West's paper has called forth a characteristic letter from Mr. W. P. Buchan, in your issue of 26th ult., in defence of his so-called "Interceptor," but abuse and assertion are not arguments, and the question is far too important to be prejudiced in that way.

The average length of a house drain may be taken at 50 ft. or 60 ft., and the so-called "Interceptor" is placed at the lower end of the flattest portion, where it is a serious obstruction to the flow of the sewage and a still greater one to the ventilation. That it is an obstruction to the flow of the sewage is indicated by the fact that all makes of this trap provide means of access for clearing stoppages, and the experiments conducted last year by the Sanitary Institute, and reported in vol. xiv. of the "Proceedings," confirm it. The results there given of 240 experiments with 50 ft. of 6-in. drain laid with a gradient of 1 in 40 show that 35 per cent. of the solids were retained in the "Interceptor" trap with a two-gallon flush, and 27 per cent. with a three-gallon flush, the whole length of drain and "Interceptor" being cleared out after each experiment. And in 120 experiments with a similar drain 26 ft. long, 28 per cent. of solids were retained by the "Interceptor" with a two-gallon flush, and 21 per cent. with a three-gallon flush, showing conclusively that in the sense of intercepting the solid matters in the sewage flowing from the house-drain the trap is correctly named.

If this is what occurs in a 6-in. drain laid with 42 ft. of open half-pipes and 8 ft. of whole pipes above ground, with a gradient of 1 in 40, and specially cleaned after each discharge, what must be the result when the drain is underground and not so specially cleaned? Why, that the "Interceptor" and the house-drain becomes a manufactory for "sewer-gas," which is forced into the sewer in front of every discharge from the drain.

In any town the total length of house-drains is at least four times that of the sewers into which they discharge, and the sewers are the best parts of the whole system, but at their best they are what the house-drains make them. The ventilated soil-pipe at the head of a drain with an "Interceptor" fixed as described, draws air in at the inlet near the "Interceptor" 50 ft. or 60 ft. away if the said inlet has not been purposely stopped up, as described by Mr. West, or the inlet valve (if one is provided) is in working order, and I venture to believe that such an arrangement is more dangerous than all the "Interceptor" traps, because the amount of air it wastes distributed over the drain above it, and thus allows the sewage a free run and the soil-pipe ventilator to draw air from the nearest street gratings. These gratings should be 100 yards apart, and in some towns they are forty yards, therefore no house-drain could be made to ventilate more than from twenty to fifty yards of sewer in its immediate neighbourhood, and the combined action of the whole of the soil-pipe ventilators on both sides of a street would be brought to bear on the two street gratings between which they were placed, and if these were 100 yards apart, and the gratings openings reduced to the minimum, that could be kept clear of road mud—say from 20 to 36 square inches area—the combined action of the soil pipes would cause a strong constant current inwards at the street gratings, each length of 100 yards of sewer being independently ventilated by the house drains and soil-pipes. This, I contend, would remove the cause of the evil, and no "sewer gas" would be produced, because the solids would be quickly removed, instead of being left behind to decompose in the "Interceptor" and the house-drain; the ventilation would then have only the vapour of the fresh sewage to deal with, as it passes rapidly to the outfall.

It is the "Interceptor," combined with badly-designed water-closet pans, that have caused the necessity for more than a two-gallon flush as a minimum, because this quantity cannot clear the trap of a wash-out pan, even if it clears the pan itself, and certainly it cannot clear the "Interceptor," as proved by the Sanitary Institute experiments, especially if it holds nearly three gallons of sewage, as many of them do.

R. READ,  
City Surveyor, Gloucester.

\* \* Inasmuch as the Sanitary Institute experiments showed that the two-gallon flush would not cleanse the straight run of pipe either, we hardly think the "Interceptor" can logically be charged with the necessity for a larger flush.—ED.

THE NEW UNIONISM.

SIR.—Will you kindly allow me, through the medium of your paper, to draw the attention of your liberty-loving readers to a new departure in the London building trade, as I question its legality. I refer to the trade union practice of refusing to work with a non-union man; every pressure is brought to bear upon him, threats are

freely given that he must submit or leave, abuse of the choicest description is hurled at him from all quarters, youngsters will lecture men old enough to be their fathers, and, in some cases, their grandfathers; many submit, but others, like myself, who have passed the age limit for all benefits but tool or strike, hold aloof. Age, poverty, misfortune, or sickness are no excuse; submit or leave. Single men, without encumbrance, know not, and care less, for the struggles of their elders to give even bread to their children. It might be weeks before the necessary entrance-fee of 5s. can be spared which one large society asks of those even beyond the age limit, but a few days or a week is the utmost time given. Whether this is fair, just, or honourable, I leave your readers to judge, but I deny its legality and condemn its selfishness. All movements up to and during the last strike in '91 stated they were composed of union and non-union men, since which they seem to have copied the tactics, but without the excuse of the dockers. The cases are different, for there the employers strove to supplant the men who were killed in their work by men who were not.

We know that public sympathy is now with all classes of workmen in their endeavour to secure a living wage, and that Government and other bodies mostly pay the standard rate; but, Sir, I have yet to learn when the union men were endowed with an exclusive right to practise their craft, and I think it is time to ask through your columns if this is a free country, and if a section of a trade who are strong, because they are united, can secure a monopoly which should be free to all? Their modest request seems to have been conceded by even Government contractors or their foremen without question. Cards are now issued to men of all trades, not because they are competent workmen, but because they are able or willing to pay for a "licence."

It used to be, "No Irish need apply"; that was altered for "Celt and Saxon and Dane are we," and I hope with equal rights; but now it is "No non-unionists need apply." For thirty years, man and boy, I have followed my trade as a journeyman in London, and during that time have been in most Radical movements till within the last few years; and it is because I feel that it is not honest of unionists to keep to themselves that which the non-unionists helped to gain, that it is a retrogressive and reactionary step, and subversive of the liberty of the subject, that I respectfully ask through your columns that at least the workshops of the Government and municipal authorities, and that of their contractors, should be free to all.

"NON-UNIONIST."

VENTILATION OF THE NATIONAL LIBERAL CLUB.

SIR.—The alleged "facts" of your correspondent "C. H." in regard to the ventilation of the National Liberal Club are very far from being correct.

1st. The apparatus apparently never gave satisfaction, and there has been no material alteration made on it since it was handed over by the late Mr. Phipson, about six or seven years ago.

2nd. The applying of forced draught (under the fire-bars) to the closed ash-pits of the steam-boilers in the boiler-house has nothing whatever to do with the ventilation of the building; this application was only made about eighteen months or so ago, and was absolutely necessary in order to give even a fair draught to the steam-boiler fires, and keep down the excessive heat in the boiler-house.

3rd. The smoke shaft never at any time passed through the main ventilating shaft; if it had been done originally, it is just possible that the principal fault in the ventilation, viz., the want of a proper means of getting rid of the vitiated air, or the want of extraction (as Mr. Keith might put it), might have been avoided and very different results been obtained.

4th. The damage to the smoke shaft mentioned by your correspondent, came about mainly because of inherent defects in its construction, and because it was not nearly large enough for the work. A new and more suitable chimney has been arranged.

Mr. Keith is, to my knowledge, thoroughly conversant with the whole arrangements, and he has, in my opinion, stated the case most fairly and correctly.

WILLIAM REID,  
Chief Engineer.

MAP OF THE CANALS OF ENGLAND.—We have received from Messrs. G. Falkner & Sons, of Manchester, a useful map, drawn up by Mr. Lionel B. Wells (late engineer to the Weaver navigation), of the canals and navigable rivers of England and Wales. The map has been so arranged as to show at a glance the independent navigable rivers and canals in use, by blue lines (2,280 miles); the railway-owned navigations and canals in use, by red lines (1,275 miles); the canals converted into railways (135 miles); navigations and canals derelict or abandoned (210 miles). Canals navigable by narrow boats, barges, and ship canals, including the Manchester Ship Canal, are distinctly indicated, as well as the companies who are carriers by canal. The map has been lithographed in a convenient form, and to all those who may be interested in the question of inland navigation, it is likely to prove very useful.



## The Student's Column.

## THE STRUCTURE AND PHYSICAL PROPERTIES OF BUILDING STONES.—XXIII.

## CARBONIFEROUS LIMESTONES.

THE massive limestone at the base of the Carboniferous System in England and Ireland is quarried in almost every district where it comes to the surface; but in general it is too hard to be extensively used as a building stone in the strict sense of the term. It is nowhere tooled with such facility as are the Jurassic freestones. In a few localities it is exploited for marble, which by those who prefer sombre and greyish tints, would be called handsome. The principal use of the limestone, however, is for burning into lime for road-metal and for rough walling stones, and as such it does not come within the scope of the present series of articles. At the same time, we are far from saying that the material is of no use for architectural purposes, other than as marble. At Hopton Wood, near Wirksworth, and elsewhere a most excellent stone is derived from this series—of a much more durable description than any of the Jurassic limestones mentioned. In Ireland, also, where Carboniferous Limestone is the prevailing rock, it yields a good though hard stone, and imparts a very characteristic appearance to the architecture of many parts of that country.

Speaking generally of the structure of the rock, we may refer the student to our previous description and illustration of a specimen of the stone from Charfield (*ante*, p. 221), and to a paper by Mr. H. W. Burrows.\* From these it will be seen that the Carboniferous Limestone is mainly made up of organic remains, very much altered by crystallisation, and bound together by highly crystalline calcite, with cleavage lines very apparent. Occasionally the stone is oolitic, and whilst visiting the numerous quarries in these beds in the vicinity of Bristol, Clevedon, Weston-super-Mare, Cheddar, and Shepton Mallet last Easter we found many horizons showing oolitic structure as perfect as the freestones of Ketton and Nailsworth, only very much more crystalline in nature.

The physical properties of the rock naturally vary over wide limits, but it is practically non-absorbent. We selected twelve samples for experiment from localities so far apart from each other as Derbyshire, Anglesey, Gloucestershire, and Somersetshire, and in neither case had the small blocks absorbed an appreciable amount after one week's immersion.

There can be no doubt that the Carboniferous Limestone would be much more extensively employed than it is for building purposes were it not in such close proximity to the fine sandstones of the same System. At Bristol it is opposed by the Pennant sandstones and those from the Forest of Dean; whilst in South Yorkshire and Derbyshire it is confronted by the enormous quantities of sandstone raised from the Upper Carboniferous, and the magnesian limestones, &c., of the Permian, added to which it is occasionally found cropping out close to the oolites of the Jurassic System, as at Shepton Mallet.

The joints in the rock are, as a rule, close together, though in Derbyshire the beds run very thick. This is a satisfactory feature where it is worked for road metal as in the Mendips and near Bristol—up the gorge of the Avon—as it saves blasting. Apart from natural jointing due to shrinkage, and ordinary bedding planes, the stone is in certain districts much cut up by small faults and other disturbances.

Whereas in England the Carboniferous Limestone is of a rugged character, being, in fact, termed also "Mountain Limestone," in Ireland it is the formation of the plains, except in the north-western districts of Leitrim, Sligo, and Fermanagh, where it rises into bold escarpments and isolated hills. Close examination of hand specimens from Ireland, as well as under the microscope, show that the structure of the rock is in every way the same as its English equivalent—it is full of the remains of corals, crinoids, and mollusca; and is quarried at innumerable places.

## OTHER LIMESTONES.

The Upper Silurian series in Shropshire and elsewhere yields limestones largely quarried for lime; in general they are too rough for ordinary building purposes, and judging from the appearance of walls and houses in and about Much

Wenlock, near Shrewsbury, the stone is not remarkable for its durability.

Devonian limestones are actively exploited in the county from whence the formation derives its name, principally for marbles, and in a secondary degree for building stone. They are chiefly wrought in and around Torquay and Plymouth; those from the latter place have been quarried for more than five centuries, and the whole are durable. Their principal drawback is excessive hardness due to their crystalline condition, by reason of which they are not very readily tooled. The cost of labour on them is so great as almost to exclude anything like elaborate moulded work or carved details, and they look best when used in large rough blocks with rugged, undressed faces. They range in hue from light grey to black, with different shades of red, and veins of white, red, yellow, and other colours. Apart from hardness, the chief objection raised to these limestones is that they carry damp; hence private houses are generally stuccoed. They constitute the chief building material of Plymouth, Devonport, Torquay, and Newton Abbot. Some of the Devonian Limestones are dolomitic, notably in the vicinity of Yealmpton, which from their high specific gravity are peculiarly adapted for sea-walls. The average micro-structure of these limestones is practically the same as the Carboniferous. They are composed of corals and shell sand, or crinoids, as the case may be, bound together by calcite, and have undergone such an amount of alteration that the cleavage planes are usually developed irrespective of the organic remains, frequently running right across these latter.

Liasic limestones nowhere yield materials that have been extensively employed far from the localities where they are quarried. As a rule the stone is not very durable, and much of it "shivers" with the frost. When taken from the sea-side, as near Lyme Regis, where it has become impregnated with saline water, it is notoriously bad. The flues of houses built of Lias limestone are usually constructed of brick.\* Perhaps the most durable stone in the Lower Lias is that of Sutton, near Bridgford, in Glamorganshire, which is a pale granular and crystalline limestone. It was used in the construction of some of the old Welsh castles, in Neath Abbey, &c. A rather noted stone from this horizon is that quarried at Downside, near Wington (Brockley Down Limestone), which, however, does not possess a very

and partially-crystalline calcareous matter, with obscure and more or less rolled organic fragments. That at Edge Hill in Warwickshire shows rolled organic fragments in a matrix of crystalline calcite; whilst the Street and Wigston stones have a somewhat similar structure, but with a large amount of crinoid remains.

The Cretaceous formation has yielded an excellent building stone at Beer, near Seaton, Devonshire. It is light grey, being chiefly composed of carbonate of lime, is fine grained, and is durable in large blocks, works readily and is durable. Geologically it occurs at the passage of the Chalk into the Upper Greensand. It was quarried far back as Norman times, and was used extensively in building Exeter Cathedral. It is a good interior stone. The Totternhoe stone from the same formation has been largely quarried at many places, chiefly in Cambridgeshire. It may be described as indurated chalk; in thin sections under the microscope it is seen to contain much sand, but the structure generally is obscure, owing to the earthy character of the carbonate of lime. It is rather absorptive; a cubic foot of weights about 115 lbs. Great care must be exercised in its selection if used externally; it is bad for interiors. Totternhoe stone has been used in Dunstable Priory, Fonthill House, Woburn Abbey, and other edifices in the vicinity.

The only building stone—and that is not much moment—raised from the Tertiary beds in England is the Binsted Limestone from the Oligocene, near Ryde, in the Isle of Wight. It is a rock of freshwater origin, and prior to increased facilities of carriage whereby other stones found their way to the island, it was in much request. A visit to the locality a short time since showed us that the sites of the quarries are now for the most part heaps of debris only; but the stone is exceedingly interesting from the historical point of view as having formed the walls of several monasteries.

Having concluded our observations on the structure of limestones raised in England for building purposes, we may now give another tab showing the results of our experiments on certain physical properties possessed by some of those described in the three preceding articles, and to economise space we give at the same time a few particulars of a similar nature concerning the Magnesian limestones and sandstones raised in the neighbourhood of Mansfield, in Nottinghamshire, to be further referred to in our next article:—

Experiments on Physical Properties of Stones Mentioned.

NAME OF QUARRY.	Specific Gravity.		Weight per cubic foot.		Absorption of water per cent.						
	True.	Particulates.	Dry.	Wet.	1 second.	1 minute.	10 minutes.	1 day.	1 week.	1 month.	1 year.
Plantation, Painswick .....	2.09	2.61	132.4	164.1	2.24	6.50	7.6	9.41	9.86		
Painswick Hill .....	2.12	2.62	132.3	163.5	2.26	6.12	8.16	9.70	9.97		
Ball's Green, Nailsworth .....	2.10	2.67	134.8	166.6	1.86	5.37	8.17	8.77	8.83		
Minchinhampton Common .....	2.49	2.60	155.4	166.0	2.1	5.2	8.26	7.81	8.32		
Weldon (At Bed) .....	2.12	2.37	127.5	147.0	0.44	0.97	0.97	0.97	0.97		
Do. (A Bed) .....	2.07	2.41	129.2	151.9	0.81	1.93	7.01	7.93	7.93		
Ancaster (Weather Bed) .....	2.44	2.61	152.1	164.1	1.40	1.00	2.61	2.81	3.01		
Ancaster .....	2.24	2.61	139.8	164.7	1.50	4.20	6.19	6.19	6.19		
Yellow Magnesian Limestone .....	2.36	2.58	147.3	161.0	1.01	1.02	2.09	3.07	3.48		
White Mansfield Sandstone .....	2.31	2.53	144.1	160.1	0.68	1.14	2.09	3.66	4.17		
Do. (another quarry) .....	2.22	2.50	138.5	156.0	2.11	3.4	4.11	4.02	5.16		
Red Mansfield Sandstone .....	2.25	2.46	147.4	153.4	0.99	1.51	1.97	4.07	4.95		
Do. (another quarry) .....	2.25	2.46	147.4	153.4	0.99	1.51	1.97	4.07	4.95		
Ighlam .....	2.16	2.58	150.7	165.4	1.0	1.7	2.6	4.4	1.36		

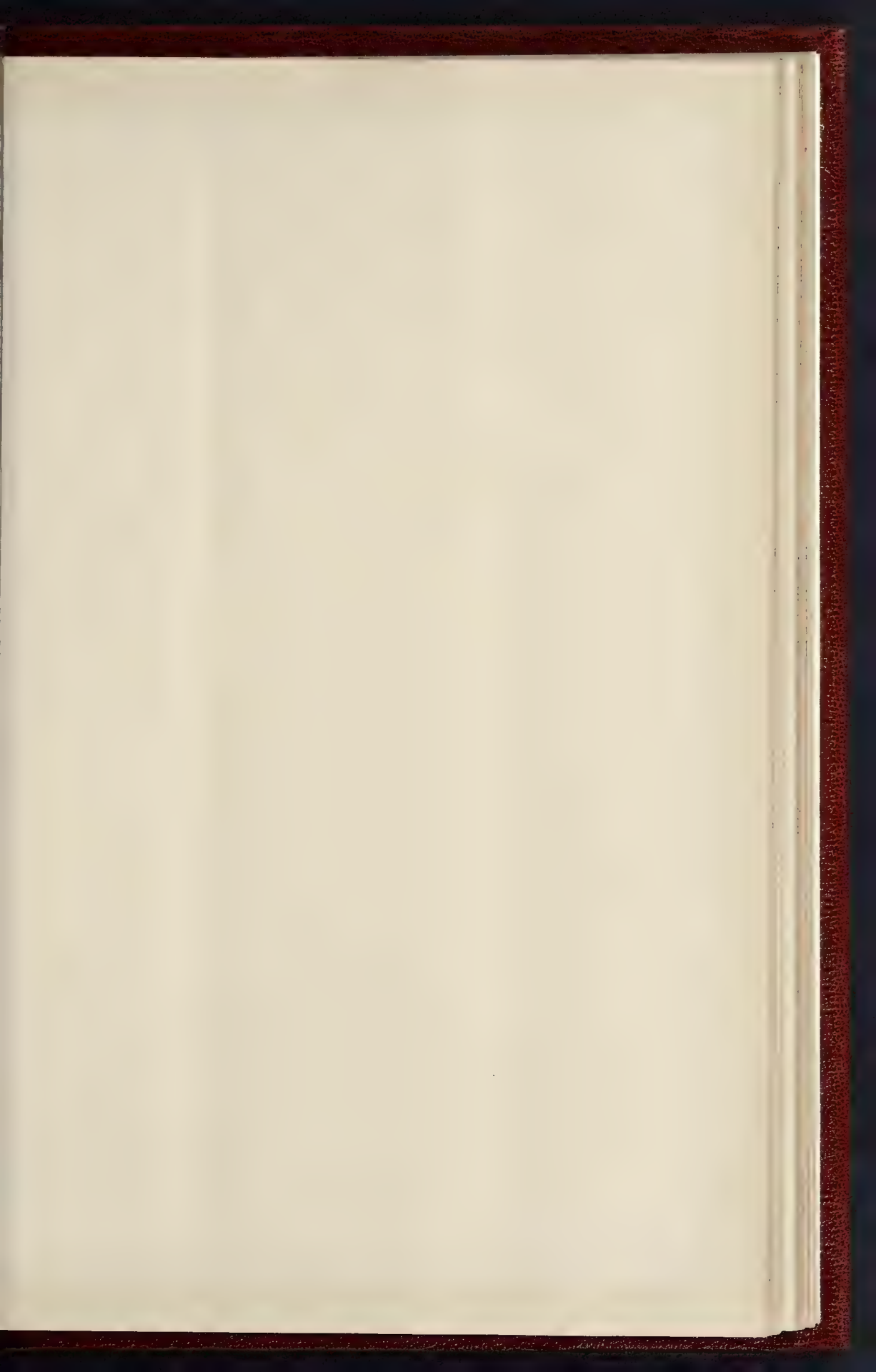
firm texture, but has a high specific gravity (2.68). Mr. H. B. Woodward remarks (*op. cit.*) that the best of the Lias building stones is that obtained from the Middle Lias of Edge Hill, known generally as "Hornton stone." In that neighbourhood it is extensively quarried, and the green and brown varieties form a pleasing contrast in buildings as may be seen at Banbury. This stone was used in most of the old churches and buildings of the district, and when well selected has proved a fairly durable material. Much of it, however, does not appear fitted to withstand great weights, being apt to crack and thus to be more readily acted upon by the weather; moreover, it is rather absorptive. In the vicinity of Sreet, near Glastonbury, at Keinton-Mandeville, and at several localities in Worcestershire and Warwickshire good paving stones are raised from this formation. The micro-structure of several of these stones has been investigated by Mr. J. J. Harris Teall. Referring to the Sutton stone, and that at Downside, he states that they have a matrix of fine-grained, semi-transparent

Referring to the oolites in the above table (from the Plantation to Ancaster), it may be said that the Minchinhampton Common stone, and that from Ancaster (weather bed), have a very high specific gravity for the class of materials; higher than any of the Whitbed or Basebed Portland. We notice at the same time that they are less absorptive than others in the table. The Plantation Painswick stone absorbs more than might have been anticipated from its external appearance, though there is little to choose between it and Painswick Hill, or that from Ball's Green. The most remarkable feature is the oolitic section in the Weldon stone; it will be observed that each variety absorbed almost as much water in one second as it did during a week; in other words, total absorption was reached in one second. The open grain of the stone no doubt accounts for this in a large measure; at the same time the amount absorbed is not excessive when compared with the oolites of the West of England.

Turning now to the second part of the table dealing with magnesian limestones and sandstones, and also a different stone from Ighlam

\* Journ. Roy. Inst. British Architects, vol. ix. (1893), p. 9, fig. 9.

\* H. B. Woodward, "The Lias of England and Wales" (Mem. Geol. Surv.), 1893, p. 293.





THE GUILDHALL, JUNE 9, 1894





DESIGN FOR BATH PUMP ROOM EXTENSION MR J M BRIDON, FRIDA, ARCHITECT.  
INTERIOR OF CONCERT ROOM.

*Royal Academy Exhibition, 1894*





Kent, presently to be described, it may be noted at the yellow magnesian limestone is not strictly comparable with the other stones mentioned by reason of its different structure. It has a high specific gravity, accompanied by low absorption, and, judging from the rate of penetration, does not readily yield to percolation. The white Portland stones are of different varieties, and it is noteworthy that one is much more readily absorbent than the other, though the difference at the end of the week is not great. The Red Kent class appears to be more uniform, and for the purpose of rock is fairly heavy and not very absorbent. The Igham stone, raised from the lower Greensand of Kent, has an abnormally high specific gravity, due to the excessive density of certain particles of mineral matter within it; it is more absorbent than are many stones of the same weight.

#### GENERAL BUILDING NEWS.

**PAVILION, SOUTHAMPTON PIER.**—A new pavilion on Southampton Royal Pier has just been opened by Mr. Wyndham Portal. The new building has been erected from the designs of Mr. Cooper Fox. The architect, at a cost of about 3,000l., its construction the building is a handsome and sheltered place, having been raised, the entrance vestibule to the pavilion is a length of 80 ft., whilst the building is 10 ft. in width. It is designed to accommodate 970 persons. The sides of the hall are formed of the old stone. The entrance hall faces the pier head, and three doors admit visitors to the lobby, from whence they pass into the hall by means of turnstiles. The whole building is lighted by electricity. The contractors are Messrs. Roe & Grace. Mr. J. J. Jones is the clerk of the works.

**ROYAL PALACE FOR GLASGOW.**—The institution which the Glasgow Town Council propose to erect on Glasgow Green, about 100 yards south of the Greenhead Baths, is a composite structure which will serve for the purpose of a museum and gallery the fine arts and also for a winter garden, in which occasional assemblages of the citizens may be held. The accommodation being provided for 10,000 persons, the building is a long, narrow structure, 40 ft. wide, designed in the Italian Renaissance style. The entrance hall opens directly on to a staircase giving access to the museum floor, and also provides communication with the other grounds, separate entrances to which are provided elsewhere. On either side of the entrance hall, the museum on the first floor occupies the whole internal space of the building, and is lit from the sides as well as from the roof. The upper floor, which is intended to be used as an art gallery, also opens from end to end without partitioned glass. The winter garden is a structure of iron and glass, and is intended to make a recommendation to the Town Council, the estimated cost of the building, the estimated cost of the building is set down at 20,000l. The designs and plans are by the City Engineer, Mr. A. B. Donald.

**SCHOOL, CHADDESLEY CORBETT, WORSHIRE.**—The 30th ult. the memorial-stone of the new boys' school, which is being erected at Chaddesley Corbett, was unveiled by Mrs. Martin. J. T. Meredith, of Kidderminster, is the architect, and Mr. R. Thompson, also of Kidderminster, is the builder.

**CRICKET PAVILION, PERTH.**—A new cricket club has just been opened by Lord Hay at Perth. The contractors were Messrs. Fraser & Morton, Messrs. MacLeish, plumber; Mr. J. Buchanan, slater; Messrs. Dow & Sons, painters. Messrs. J. & G. G. of Perth, were the architects.

**SCHOOL OF ART, DOVER.**—On Monday Lady Darnley, the Mayoress, laid the foundation stone of the new School of Art, Science, and Technology which is being erected by the Corporation at Dover. The new building adjoins the Municipal Offices in the town. The space occupied by the school is a plot of land with a frontage of about 51 ft. to the Ladywell, where the entrance is placed at a depth of about 105 ft. The building will consist of three stories. On the ground-floor provision is made for additional class-rooms, rooms for surgery, store-rooms, heating apparatus, &c. The first-floor, which is reached from Ladywell by a stone staircase, is level with the Council chamber at the end of the *Maison Dieu* hall, and the entrance will be formed at this point, so direct access to the existing buildings and the new school is obtained. The building is to be divided into the various rooms. These are, head-master's room, fronting towards Ladywell; elementary room, by 31 ft. communicating by means of a stone staircase with the advanced students' rooms; a room for building construction and machinery; a small chemical laboratory with a heating science lecture room, and the necessary room and lavatories for male students. The ground-floor will be 15 ft. high, and lighted by square-headed windows. From the first

floor the staircase continues to the top story, upon which the principal rooms of the art school are placed. These consist of a class-room for advanced students, 40 ft. by 34 ft. and 21 ft. high to the centre of the ceiling, lighted by one large window. A painting-room, 37 ft. by 21 ft.; art lecture-room, 21 ft. by 21 ft.; small library, 16 ft. by 14 ft.; and the requisite cloak-rooms and lavatories for ladies and gentlemen. Upon this floor, also, has been provided a kitchen 25 ft. by 19 ft., together with a small scullery, suitable for cookery classes. Extending the Ladywell front is designed to assimilate with the present municipal buildings to which it is attached. These offices and the Connaught Hall were designed by the late W. Burgess, A.R.A., and carried out after his decease in 1881. The walls up to the first-floor level are faced with Kentish rag, and above with flint work, the whole having Portland stone dressings. The contract for the building work of the new school is 10,278l., and the whole is being executed by Mr. W. Bromley, builder and contractor, of Dover, from the designs and under the superintendence of Mr. John S. Chapple, architect, Adelphi, W.C.

**CHAPEL, BARRY DOCKS, GLAMORGANSHIRE.**—On the 4th inst. the memorial stones of the new Tabernacle Welsh Independent Chapel, Holton-road, Barry Docks, were laid. The chapel takes the place of a temporary iron structure erected about four years ago. The structure is 47 ft. long by 34 ft. 6 in. wide, and is 25 ft. high from floor to ceiling. It is roofed with a gallery and pitch-pine seating, with a pulpit in pitch-pine. On the ground floor and gallery there is accommodation for 475 persons. The ceiling is designed with pitch-pine beams and match-board paneling. Underneath the chapel there is a schoolroom, 34 ft. by 27 ft., divided by a partition in the middle. The front is in Renaissance style, with Forest stone dressings and coloured cement work. The chapel was designed by the late firm of Messrs. Seward & Thomas, architects, Cardiff, and completed under the personal supervision of Mr. George Thomas. The contractors are Messrs. E. R. Evans & Bros., of Barry and Cardiff, and the clerk of works Mr. Jenkin Meredith, of Barry Docks. The chapel is heated by Messrs. Constantine patent stoves. The total cost of the building has been 1,050l.

**MEMORIAL CHAPEL TO THE DUKE OF CLARENCE.**—A new chapel at the Gordon Boys' Home, Chobham, erected in memory of the Duke of Clarence and Avondale, was recently dedicated at Chobham. The chapel, built from designs by Colonel Edis, is the honorary architect of the institution, is of red brick with ornamental facings. It consists of chancel with organ chamber, still to be filled, and nave. The flooring of the chancel is glass mosaic, and the roof is of oak, as are also the choir stalls and pulpit. A window, depicting St. Edward the Martyr, killed at Berkeley Castle, is placed in the screen of the chancel, the gift of Colonel Edis, in memory of the Duke of Clarence and Avondale. Messrs. Clayton & Bell have executed the work.

**ALTERATIONS TO ST. MARY'S CHURCH, WISBECH.**—The Parish Church of Wisbech St. Mary, three miles from Wisbech, has just undergone some alterations. The old pews have been replaced by pitch-pine seats, the roof has been re-laid with Staffordshire red and blue tiles with bordering to match, a new heating apparatus has been put in and the walls and nave pillars have been re-plastered. The work has been carried out at a cost of 850l., in accordance with plans furnished by Mr. William Basset-Smith, architect, Adelphi, London.

**CHURCH, BLACKBURN.**—The plans for the building of the new church of St. Silas, at Billinge, Blackburn, prepared by Messrs. Paley & Austin, of Lancaster, have just been accepted by the Building Committee. The new church will seat 616, and will cost 8,000l. independently of the spire.

**WESLEYAN CHAPEL FOR NEWBURN, NORTHUMBRIA.**—The memorial stones have just been laid of a Wesleyan Chapel for Newburn. The site of the building is in front of Boyd-street. When erected, the chapel will be able to accommodate a mixed congregation of 400 people, and the total estimated cost is 2,000l. The building will be of wood-work with a roof of pitch pine, together with a carved rostrum of the same material. The windows will be of stained glass. The architects are Messrs. Thompson & Selby, of Newcastle, and the building contract has been let to Mr. John Anderson, of Walbottle.

**RESTORATION OF STANFORD-ON-SOAR CHURCH, NOTTINGHAM.**—On the 24th ult. Stanford-on-Soar Church was reopened after restoration. The work was carried out by Mr. J. Thomson, of Peterborough, and Mr. W. S. Weatherley, of London, was the architect. The restoration consists of the construction of a new chancel, vestry, and porch, with new oak roof to nave and aisles, covered with lead. The fittings throughout are of oak, and those in the chancel are of oak and carved, and the pavement is in marble. In the Trinity is a panel illustrating the Resurrection, and also having figures of St. Peter and St. Paul. The north subject shows the "Nativity," and the south "The Baptism of our Lord by St. John." On another side are figures of St. Michael and St. Gabriel. The font is of alabaster, with Derbyshire marble steps, and is of

hexagonal form. Three of its panels are filled in with sculpture. Some windows have been opened out, which formerly were obstructed by mural monuments, and the original level of the nave has been secured. The tower, in which has been placed a new peal of six bells, by Messrs. W. Taylor & Sons, Loughborough, has been made up with new roof and restored pinnacles, surmounted with vanes. The porch is rebuilt upon the actual foundations which were discovered of the original porch. Two stained glass windows have been put in to the memory of the late Miss Ratcliff. This part of the work was entrusted to Mr. Charles Powell, of London, and Messrs. Clayton & Bell, of London. The new heating arrangements were completed by Mr. Messenger, of Loughborough. The cost of the restoration is about 7,000l.

**WESLEYAN REFORM CHAPEL, CLIFFE BRIDGE, YORKSHIRE.**—A new Wesleyan Reform Chapel is being erected at Cliffe Bridge. Messrs. Wade & Turner are the architects, and the building contract is held by Messrs. J. R. Potter, of Barnsley. The accommodation to be provided is for 200 persons, and for the convenience of the Sunday-school.

**DRILL HALL, HARTLEPOOL.**—On the 2nd inst. a drill-hall was opened by the Earl of Durham at Hartlepool. The new building, which faces the N.E.R. Station, is built of red brick, from designs of Mr. J. J. Wilson, of West Hartlepool, by Mr. R. Watt of that town. It is 72 ft. long by 34 ft. broad, and has a slated and pitch-pine roof, the portion of the floor used by the gunners being of oak. At the east end is a second story, containing on its two floors officers' and non-commissioned officers' rooms, reading-room, and armoury.

#### SANITARY AND ENGINEERING NEWS.

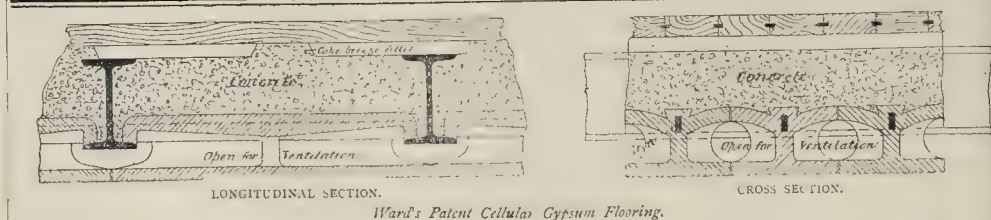
**RUGELEY WATERWORKS.**—The Rugeley Local Board have let the contract for the construction of brick service reservoir and laying of iron pipe mains to Mr. H. Shardlow, Nottingham, whose tender amounted to 2,421l.; and to tender Messrs. Woodroffe & Co. for the supply of cast-iron pipes, &c., amounting to 2,137l., has been accepted. The engineer is Mr. W. H. Radford, C.E., of Nottingham.

**INSANITARY AREAS IN LEEDS.**—The Sub-Sanitary Committee of the Leeds Corporation, which was formed for the purpose of dealing with the insanitary areas within the city, held a meeting on the 4th inst. Alderman Ward (the Chairman) presiding. At a previous meeting the committee had adopted a general scheme with reference to the insanitary areas, and on Monday it was resolved to instruct the City Engineer (Mr. Hewson) to divide the area proposed to be dealt with into six or eight sections, and to obtain estimates as to the probable cost of dealing with each section, in order that the same might be laid before the General Committee. The committee will then consider which section shall be dealt with first, and each section, as dealt with, will be laid out in accordance with the general scheme. To enable the Corporation to deal with the insanitary areas, it will be necessary to obtain a Provisional Order, and it is intended to get the scheme matured, so that application may be made to Parliament during the next session.

#### FOREIGN AND COLONIAL.

**FRANCE.**—The exhibition of Callebott's paintings, to which we have referred, was opened on Monday last at the Durand Ruel Gallery. There is again talk of the entire completion of the Halles Centrales at Paris, both in regard to the buildings and approaches. The exhibition of the competition designs invited by the Société Nationale des Architectes de France will take place from July 3 to July 5. It is proposed to enlarge the Carnavalet Museum, by the purchase of the Hôtel de Peletier, Saint Fargneau, which would be specially devoted to collections connected with the revolution period. The celebrated group by Mercier, "Quand même," which represents an Alsatian woman supporting a wounded soldier, has been erected in the central alley of the Tuileries Garden, near the Carrousel arch. M. Desca, the sculptor, has just completed a monumental fountain for the town of Tarbes. A new museum of decorative art is to be opened at Troyes, through the generous assistance of a sculptor, M. Piat, who is a native of the Département de l'Aube. The French Archeological Congress was held at Saintes last week, for three days. In the excavations undertaken by M. Dellys (Algiers), M. Gavault, architect, has discovered the remains of a large basilica, 40 metres in length, and which appears to date from the fifth or sixth century. It is covered with numerous carved designs and ornaments presenting, it is said, a curious analogy with the carvings of existing Kabyle tribes. Steles and other remains found in the neighbourhood seem to indicate that the church was built near or on the site of an older Pagan temple. A syndicate of the inhabitants and tradesmen of the Palais Royal quarter at Paris have got the idea of "reviving"





this neighbourhood, once so gay and now so neglected, by the erection of a hippodrome in the garden, which is to preserve the general architectural harmony of the Palace and only occupy a portion of the garden. It is to be hoped that the Government will refuse to sanction this, and will recognise that a better way to revive the Palais Royal quarter would be to pull down ruined houses and to open wider streets.—The sudden death is announced of a distinguished landscape-painter, M. Pierre Mousset.—M. Vacherot, member of the Société Nationale des Architectes Français, has died, at the age of 47.—The gold medal of the Société Centrale des Architectes has been awarded, by the recommendation of the Académie des Inscriptions et Belles Lettres, to M. Jules Tontain, former member of the École Française at Rome.—It is proposed to create in Paris a certain number of small hospitals for sick children, to replace the Hôpital Trousseau, which is very unsuited to deal with infectious diseases.

GERMANY.—A new turn has been taken in the matter of the site question of the 1896 Exhibition, since the grand committee have unanimously passed a resolution in favour of asking the Emperor to lend the Hippodrome in the Tiergarten for the purposes of the exhibition. His Majesty has, however, refused his permission and strongly recommends the Lietzensee site. The matter is in the competition for a monumental fountain at Stettin has been awarded to the sculptor, Ludwig Manzel, by the unanimous decision of the Prussian Art Commission. The design takes the form of a female figure, representing Stettin, enthroned on a ship. The Commission has entrusted the execution of memorial church, to Professor Schafer, the minor decorations will be by Professor Enke, Otto Lessing, and others.—The annual general meeting of the Society for the Advancement of German River and Canal Navigation was recently held at Berlin. After the annual report had been presented, Herr Möller lectured on the proposed Schwerin Wismar canal.—A movement is on foot to erect a monument to Hans von Bülow at Hamburg.—The Bavarian Diet have declined to grant the 5,000,000 necessary for a preliminary survey in connexion with the proposed Main-Danube Canal.

DENMARK.—The electric installation in the Marble Church has been completed, and the great organ is now being mounted. Professor Mildahl, the chief crown architect, states that the entire edifice will be fully completed in about three months, but worship will commence at Whitsuntide. It has become necessary, on account of the bad acoustics, to erect two pulpits, one on each side of the altar, to be used alternately, according to the wind, as it has been found that either is useless with certain winds. They will be decorated with carving and form continuations of the balustrades of the altar.

The Communal Hospital of Copenhagen is to be enlarged and improved at a cost of 300,000 Kr.; whilst two new communal schools are to be built.—The new central premises of the Copenhagen Telephone Company are now almost completed, and they will be the largest of their kind in Scandinavia. The great telephone hall is vaulted and surmounted by a huge square tower of iron girders rising 50 ft. above the roof, with a diameter of 32 ft., and which can receive 4,000 wires. The entire structure has been designed and constructed by Herr Henriksen, member of the Polytechnic Institute and also of a firm of engineers. The premises are situated in the centre of Copenhagen.—Since the beginning of the spring, with milder weather, work on the Glyptothek or Art Gallery is rapidly progressing. The roof of the central hall is now being laid and the yellow marble columns are being mounted in the vestibule. The main roof will be vaulted, but the roofs of the two great wings are to be covered with glass.

A new asylum, in red bricks, has been completed in the city, the architect being Herr Lendorff, and the cost 35,000 Kr.—A new church, the Gethsemane, has been added to those of Copenhagen, at a cost of 25,000 Kr. The framework is of iron.—A large well-known estate in Copenhagen, the so-called Ny Bakkegaard, is being sold in plots, with a view to the erection of semi-detached dwellings in English style on the site.—An important new public building in Copenhagen will be ready for occupation next month, viz., the new Danish Art and Industrial Museum. The ground floor is to be occupied by public archives, and on the first floor,

on a level with the Western Boulevard, are situated the offices of the administration, the reading-room and two designing rooms. At the back, overlooking the sea, is a large lecture hall, 3,500 ft. square. The collections of the institution will be arranged on the second floor, whilst the third floor constitutes a residence for the director, with an atelier for reproduction. The building is so large that there is room, for the present, for some other collection. It will be lighted throughout by the electric light. The total cost is estimated at 375,000 Kr.—The Danish Government has introduced in the Rigsdag a bill for the increased taxation of house property.—A new public park has been added to the open spaces in Copenhagen. It is situated close to the English Church, on a portion of the Free Harbour site, and overlooks the Sound. An Eiffel Tower is projected.—All the streets in the central and fashionable part of the city are at present in a chaotic state, roadways and pavements having been broken up, in order to improve and enlarge the sewerage and gas systems and cover the thoroughfares with asphalt.

NORWAY.—A curious architectural competition, which has excited much interest in Scandinavian building circles, has just been closed. A well-known Swedish operatic singer, having married a wealthy Russian lady of title, some time ago invited Scandinavian architects, i.e., Swedish, Danish, and Norwegian, to compete in designing a villa on an island purchased by him in the Christiania fjord, to be provided with all modern requirements and built according to a specification, but the style was to be left to the option of the competitors. The invitation has resulted in the sending in of no less than 232 designs. There are three good premiums, and the jury selected by the owner is beyond reproach.

The Corporation of Christiania has commissioned Herr V. Nordan, a well-known architect, to erect the projected new municipal hospital in the city.—The premises of the largest exporter of and dealer in game, &c., in Norway have just been completed, in which structure the entire façade is covered with pink marble from the province of Nordland. This is the first building in the capital in which natural stone has entirely replaced stucco, and the step is much welcomed by the Press. All the ornamentations, columns, &c., are also of Norwegian polished marble in various colours. The sale-rooms of the interior are decorated with frescoes.

The architect is Herr Reuter.—A new red-brick structure in Gothic style has also just been completed for the Association of Physicians in Christiania. The building is surmounted in front by a piece of allegorical sculpture, modelled by the well-known sculptor Herr B. Bergslien, of a knight in full panoply (representing medicinal science) spearing a dragon (representing disease), in the style of St. George and the Dragon. The architect is Herr H. Nissen.—The Teetotal Society of Christiania has accepted the designs of Herr J. O. Hjorth for a new meeting-house, a building which promises to become another ornament to the capital.—A new building society, that of the "Christian Workman," has been formed in Christiania, with 380 members. The Sagene's Workmen's Dwelling Society shows a surplus for 1893 of 3700, the dividend being 4 per cent. This flourishing Society is managed by prominent public men, some being also leading architects and engineers.—An establishment is now being completed on the Holmenkollen, a mountain ridge 1,500 ft. above sea-level, overlooking Christiania and the fjord, which is to be a health resort. The buildings are in "Old Norse" style, and the interiors, with appointments, are also kept in the same style as far as possible. The carved furniture is likewise Norse, and the walls are hung with woven Norse tapestries. There is also a Norse so-called "Peisestue," a kind of hall where winter visitors will be cheered by an enormous old-fashioned hearth and a log fire, as in the days of the Vikings.

Hitherto all streets in Christiania, except three, have been macadamised, but in the next few years a number of thoroughfares are to be laid with wood or asphalt, at a cost of 308,000 Kr. As the former kind of roads is expensive to keep clean, it is estimated that a saving of 2,300 Kr. a year will be effected with the new materials.—A national exhibition will take place this summer in Tromsø, not far from the North Cape.—The town of Skien, almost entirely destroyed by fire some years ago, has now been rebuilt, and it has become necessary to enlarge its boundaries considerably. No timber

houses are now allowed. A new municipal church has been built facing the fjord, in Gothic style, with ornaments and bands in white Norwegian marbles and gold. The spire is 200 ft. in height. The architect is Herr H. Berg. The interior is decorated with Biblical frescoes.

#### MISCELLANEOUS.

WARD'S CELLULAR FLOORING.—This floor, made by Messrs. B. Ward & Co., of Westminster, is an application of gypsum in cellular slabs, to afford protection to iron, provide ventilation around iron, and take off some of the weight of concrete gypsum being lighter than either concrete or fire brick. As will be seen, it forms naturally a nearly smooth finish for the ceiling, and it also checks that transmission of sound which is one of the drawbacks of plain concrete floor. The same type of hollow gypsum slabs can also be used as a fire-resisting casing to iron columns. The patentees also propose to use these hollow slabs as a means of keeping basements floor dry.

PUBLIC WORKS, LUTON.—The Town Council of Luton have decided to apply to the Local Government Board for permission to borrow the following sums of money and for the purposes stated:—1,400l., free libraries; 2,000l., paving works and street improvements; 7,000l., recreation grounds, east ward, west ward.—New, or private street improvement works are in course of construction by Messrs. Thomas Free & Sons, of Maidenhead, to the amount of 2,500l., and George-street, the principal thoroughfare—has been re-paved recently on one side at a cost of 450l. The Borough Surveyor is Mr. T. Ridyard Roscoe.—The Children's Sick and Convalescent Home, which is to be presented to the town by Mr. A. P. Welch, J.P., of Bridgenorth, at an expense of about 2,500l., will be opened by the Duchess of Bedford on the 13th inst. The new building is situated upon the London-road overlooking the town of Luton, and it has been erected by Messrs. T. & E. Neville from the designs of Messrs. J. R. Brown & Son, architects of Luton. The foundation stone was laid last summer by Lady Battersea.

APPOINTMENT.—The Maldon Union Rural Sanitary Authority, Essex, at their meeting on the 29th ult. appointed Mr. H. G. Keywood, Assistant of the Borough Engineer's Office, Nottingham, as the Surveyor and Inspector of Nuisances, at a salary of 200l. per annum. There were several other applications.

WESTMINSTER ABBEY.—On the 31st ult. in the House of Commons, Mr. John Ellis asked the First Commissioner of Works whether any, and if so what steps had been taken to carry out the recommendations of the Royal Commission on Westminster Abbey, dated June 24, 1891, that no time should be lost in removing the houses in Old Palace-yard which not only concealed to a great extent the architecture of the Chapel of Henry VII. and the ante-chamber, but were also a constant source of danger to the Abbey from fire; and whether the Government that no step of any kind should be taken which would involve any of the ground cleared being built upon without the matter being fully discussed and decided by the House of Commons.—Mr. H. Gladstone, in reply, said that for some time past negotiations had been in progress for the removal of the houses. Arrangements had already been arrived at for acquiring certain interests including those of the freeholder and the Ecclesiastical Commissioners. When the possession of the property had been obtained, which could be before the middle of next year, it was intended soon as possible to demolish the buildings, when the public would be in a position to judge what ought and what ought not to be done. Parliament would have full opportunity of expressing its opinion on subject.

SCHOOL OF ARCHITECTURE, LIVERPOOL.—On Wednesday, at the monthly and special meeting of the Liverpool City Council, the Library, Museum, Arts, and Technical Instruction Committee presented for confirmation an amended report on proposed School of Architecture and Applied Art. The chief feature of the report was the formation of a Board representing conjointly the Corporation, the University College, the Liverpool Architects' Society, the Liverpool Academy of Fine Arts, Liverpool Master Builders' Association, and Liverpool Building Trades Federation. On this Board



was proposed to allocate to the Council six out of sixteen seats. The Council was recommended to take towards the school out of the technical instruction fund 1,000*l.* per annum. Sir W. Wood moved, and Mr. Willink seconded, the adoption of the report. Alderman F. Smith opposed. The Council were providing money without having control. Mr. Taggart said the spirit as well as the letter of the Act had been absolutely disregarded by the committee, because ninety-nine out of every hundred of the citizens could not avail themselves of a school of architecture. To provide clogs and breakfasts for poor children might break the letter of the Act, but it would be more common sense than establishing a school of architecture. Mr. Burgess continued the discussion by observing that Mr. Taggart professed to speak on behalf of the working men, but he might be reminded that men who had become eminent as sculptors and architects had begun as artisans. The municipality ought, in its interest, to afford every opportunity to such men. Mr. Willink, who earnestly defended the scheme of the sub-committee, pointed out that the working men of Liverpool had now no opportunity of obtaining the artistic training which machinery could not impart. At present artistic work had to be sought outside the city. Every year buildings were being put up, more and more elaborate, and requiring more and more artistic craftsmanship. Consequently, every year more and more went outside the city for work which the artisans of Liverpool would be able to do. The school was wholly for the benefit of working men, even though present working men were not disposed to avail themselves fully of the advantages offered. It was, of course, impossible that the school could benefit men who had no craft and depended simply on their soles, but those were only a portion of the working men. Mr. Taylor hoped the professor of architecture would be a practical architect. The danger was that the school would be academical rather than practical. Mr. Willink said the intention was that the professor of architecture should be a thoroughly practical man. After further discussion the report was approved.

# LEGAL.

## GODDARD v. GROSVENOR.

THE case of Goddard v. Grosvenor came before Mr. Justice Charles, sitting without a jury, in the Queen's Bench Division, on the 30th ult., being an action brought by Mr. R. W. K. Goddard, an architect, to recover from the defendant, the hon. secretary of a committee formed in 1891 to carry out a proposed enlargement of St. Al's Church, Clacton-on-Sea, 70*l.* odd for certain plans and designs, which he alleged he had prepared at the request of the enlargement committee. It was said that in the first instance the committee proposed to alter one altar at a cost of 1,000*l.* It was necessary for the plaintiff when designing that alteration if funds were forthcoming to enlarge the whole church, so as to seat 1,000 persons instead of 600 as originally constructed. The plaintiff alleged that the work occupied him ten days. Expert evidence was called to show that the plaintiff's claim was within the charges fixed by the usual custom and usage of the profession, but the learned Judge said that it was a question for the judge and jury as to what sum was reasonable remuneration for work done and services rendered in all the circumstances of each particular case. Defendant admitted liability to the extent of 25*l.*, which he paid into Court. On the conclusion of the arguments the learned Judge gave judgment for the plaintiff for fifty shillings, inclusive of the amount paid into Court. Mr. Moresby appeared as counsel for the plaintiff, Mr. Houghton for the defendant.

## LIGHT AND AIR CASE.

### BAILLIE v. CAMPBELL.

THIS was an action which was tried before Mr. Justice Rowlatt in the Chancery Division, on the 1st inst. The plaintiffs were Mrs. Anna Glenworth, widow, and Hugh Smith Baillie, and the defendant Mr. Frederick Lorn Campbell, who was liable for damages for alleged obstruction of light and air, upon premises No. 10, Cranley Gardens, Kensington; and an injunction was sought restraining the continuance of the obstruction. The defence was one of general denial. Mr. R. B. Haldane, Q.C., and Mr. A. & Beckettrell, appeared for the plaintiffs; and Mr. R. W. L. C. C., and Mr. Fellows, for the defendant. Professor Banister Fletcher was the first witness for the plaintiffs. He said he inspected the premises in the month of March last, and in his opinion the obstruction caused by the addition in the adjacent premises, No. 12, was such as to cause substantial injury to the lights and windows of No. 10. There was a loss of five-eighths of sky surface to one low. He had not considered the effect of it in letting value of the house. His lordship: He should say the effect upon letting value would be to reduce it by about 20*l.*

Major Speed, the tenant, corroborated as to the deprivation of light and air, remarking that the upper rooms were rendered very stuffy.

Cross-examined by Mr. Neville: Witness called the diminution of light serious. As to the depreciation in the letting value, he instanced an occasion when a medical man came and looked at the house. He came again with his wife and as they left the doctor complained of the deficient light and came no more.

Mr. William B. Catherwood, architect and surveyor, also corroborated, and this concluded the plaintiff's case.

Mr. Woodd, architect and surveyor to Guy's Hospital, residing at 5, New Bond-street, was then called for the defence. He said he had considered the effect on the access of light, though he confessed that he had not seen the rooms before the alteration.

Mr. Thomas, member of the firm of Rogers, Jarman, & Thomas, auctioneers and surveyors, said he visited No. 10 and No. 12 with a view of seeing what the difference in the letting value was by reason of the alleged obstruction. In his opinion the value did not differ to a material extent.

Cross-examined by Mr. Neville: Substantially, Mr. Thomas, you think that this house is just as good a house for letting purposes as any other house in the row?

Witness: I do.

Mr. Haldane: There is no difference of any sort? Witness: No.

Mr. Cummings, architect and surveyor, and Mr. James Parke, builder, having also given evidence.

Mr. Neville addressed the Court contending that the plaintiffs were not entitled to claim for loss of prospects. He submitted that they were only entitled to claim, if at all, in respect of the light; and that there had been an enormous exaggeration in the evidence for the plaintiffs. Therefore small damages should be sufficient.

Mr. Haldane, in reply, said the house was worth something over 3,000*l.* Here was an alteration wrongly made and the injury done was substantial, so the damages must be in proportion.

His lordship, in a brief judgment, said the only question was the amount of damage and this he assessed at 130*l.*

Judgment for plaintiffs with costs.

## DAINGEROUS STRUCTURES.

### IMPORTANT POINT UNDER THE METROPOLITAN BUILDINGS ACT.

THE case of *ex parte* Herring came before Justices Cave and Collins sitting as a Divisional Court of Queen's Bench on Monday, it being an application on behalf of the owner of some houses in Wandsworth to set aside ten orders made by Mr. Biron, Stipendiary Magistrate under the Metropolitan Buildings Act for pulling down some water-closets and wash-houses at the backs of houses in Richmond-road and Charles-street, Wandsworth, as being "dangerous," on the ground that such orders could only be made when the structures were dangerous to passengers. The Metropolitan Buildings Act (18 & 19 Vict. c. 122, s. 69) gives power to the Local Authority (which has been now transferred to the London County Council), on their receiving a complaint that any structure in any building or wall is in a dangerous state, to require their Surveyor to make a survey and report, and if he reports that the structure is dangerous to passengers, then to order it to be shored up for the protection of passengers; and on his making a complaint to a Magistrate, he may order the structure to be pulled down. The report in question did not state that the structures were dangerous to passengers, or passers by, but it showed that they were dangerous to the inmates of the houses.

The magistrate refused to state a case, and Mr. H. Tindal Atkinson moved for a rule or order in the nature of a mandamus to compel him to do so. He contended that the order to pull down could only be made when the report showed danger to passengers or passers by.

Mr. Justice Cave, in giving judgment, said that if the learned counsel's contention were right the effect would be to narrow or defeat a very salutary statute, and in his opinion the application ought to be dismissed.

Mr. Justice Collins concurred, and the application was accordingly dismissed.

## CAPITAL AND LABOUR.

THE STRIKE IN THE SOUTHPORT BUILDING TRADE. — The bricklayers' labourers' strike in Southport has been settled by the men accepting the employers' offer of sixpence per hour.

STRIKE OF BURNLEY JOINERS. — On the 1st inst., the carpenters and joiners of Burnley, numbering over 200, stopped work for an advance of wages and a reduction of hours. The advance demanded was 3*d.* per hour. An offer of the masters to give an advance of 3*d.* per hour now, and the remaining 4*d.* in six months, having been unanimously rejected, the building trade of the town will be paralysed during the continuance of the strike.

## MEETINGS.

### FRIDAY, JUNE 8.

*Royal Institution.* — Mr. C. Vernon Boys on "The Newtonian Constant of Gravitation." 9 p.m.

### SATURDAY, JUNE 9.

*St. Paul's Ecclesiastical Society.* — Visit to the church of Chalfont St. Giles under the guidance of the Rev. C. H. Evelyn White, F.S.A.

### MONDAY, JUNE 11.

*Royal Institute of British Architects.* — The Fifteenth General Meeting (Business) of the Session: (1) To receive the Report of the Scrutineers appointed by the Annual General Meeting to direct the election of the Council, Standing Committees, &c., for the year of office 1894-95. (2) The President to move: — That the Royal Institute of British Architects has learned with much satisfaction that the position of Architecture will be duly recognised in the proposed Teaching University for London, by the inclusion among the Senate of the University of a member to be appointed by the Institute, and that the Institute cordially desires to render every assistance in its power to the establishment of such University. (3) Mr. Bernard Dicksee and Mr. Henry Lovegrove to raise and discuss questions relating to the qualification and election of Fellows. 8 p.m.

### THURSDAY, JUNE 14.

*Society of Antiquaries.* — 8.30 p.m.

### FRIDAY, JUNE 15.

*Liverpool Engineering Society.* — Excursion to the site of the proposed Elan Water Supply of the Birmingham Corporation.

### SATURDAY, JUNE 16.

*Architectural Association.* — Visit to Eton College, &c. Train at 1.30 p.m. from Waterloo.  
*Architectural Association Camera Club.* — Visit to Brewer's Hall, Adde-street, E.C. 2.30 p.m.  
*Liverpool Engineering Society.* — Excursion to the site of the proposed Elan Water Supply of the Birmingham Corporation. (Second day.)

## RECENT PATENTS.

### ABSTRACTS OF SPECIFICATIONS.

- 10,470. — WATER SUPPLY APPARATUS: J. Shanks. — Special construction, consisting of a hollow rim round the water with a groove to direct the discharge of the flushing water to the outlet, with separate compartments in cistern, and an arrangement for supply to series of closets, form the substance of this specification.
- 11,335. — SPRING FASTENER FOR DOORS: F. Somerscales. — This is an automatic door fastener, with a spring latch and a bolt controlled by a spring, so that the bolt is fixed into a corresponding hole so soon as the door is released.
- 12,274. — SWIVELLING DOORS: H. G. Flood. — Fastening by means of bolts or rods are provided to swivelling doors such as are in use in hospitals, &c., but for use principally on board ship for state-rooms, cabins, &c. By means of the fastening the doors can be locked in any position, as in warm weather, partly open to cause a draught and flow of cool air, or in cold weather to avoid a draught and secure absolute privacy.
- 12,468. — IMITATION MARBLE: G. A. Goetz and another. — A product of limestones calcined in a special way and in certain proportion to other earths. Colouring matters are added in the usual way to imitate different building stones or marble.
- 12,472. — ORNAMENTAL BRICKS, TILES, &c.: A. Shelders. — The face of the brick, tile, or walling is ornamented by acid-coloured or pot glass, and a rough backing is supplied so as to render the adhesion to the wall perfect.
- 4,223. — ARTIFICIAL STONE OR MARBLE: P. Baumert. — The greater portion of this artificial stone is composed of a low value material, such as sand, comminuted material, serves as a backing for marble or a superior material ground to a fine powder and similarly solidified and fixed.
- 4,389. — INLET SEWER VENTILATOR: M. Martin. — The object of this ventilator is to give a current of fresh air to a main drain, and prevent the exit of foul air through the inlet, shafts being provided for the exit of the foul air. Mica flaps and filets act as a flap valve to prevent the exit of the foul air.
- 6,626. — AUTOMATICALLY DISINFECTING: B. Claunder. — The contrivance consists of a receiver with a mixture of fluid disinfectant, carbolic acid, chlorate of iron, &c., &c. The disinfectant is allowed to flow by opening a flush-cock into the flushing-pipe. As soon as this operation is over, the receiver is closed till it is filled again with disinfectant from a reserve receiver. Double valves are employed, and when one is open the other is closed, thus controlling the flow of the liquid.

### NEW APPLICATIONS FOR LETTERS PATENT.

- MAY 21. — 9,836. J. Parr and others, Facing and Enamelling Bricks and other Structural or Ornamental Pieces for Building and other Architectural Purposes. — 9,836. W. Quelch, Sash Windows. — 9,860. F. Golby, Pressed Glass Plates for Lining Walls, Ceilings, &c.
- MAY 22. — 9,993. J. Phillips, Hinges. — 9,993. J. and J. Hatwell, Window-sash Fastener and Ventilator combined.
- 9,948. H. Maurer, Porous Bricks. — 9,956. C. Polain, Screw Nail.
- MAY 23. — 10,035. J. Fox, Paving Bricks.
- MAY 24. — 10,050. T. Dowd, Window and Door Fasteners. — 10,085. A. Cay, Ornamental Sheet Glass. — 10,085. Hamilton, Composition of Bricks, &c. — 10,094. J. Wilson, Self-acting Draught-preventer.
- MAY 25. — 10,136. J. Colong, Door Hatches. — 10,157. T. Templeman, Syphon Flushing Cistern. — 10,189. G. Chardier, Combined Sliding Sashes and Hinged Casements for Windows.
- PROVISIONAL SPECIFICATIONS ACCEPTED.
- 7,149. H. Lake, Flushing Cisterns for Water-closets. — 7,770. J. Garrod, Flushing Cisterns working with a Syphon. — 8,297. A. Cairne and H. Gilmor, Paint Compound and Pigment. — 8,298. A. Cairne and H. Gilmor, Paint Compound or Pigment. — 8,477. R. McDonald, Waste-water Preventers for Flushing. — 8,584. W. Mann and J. Pullan, Machines for Pressing Bricks, Tiles, &c. — 9,435. V. Knowles, Ventilator for Builders, &c.



[illegible]







MIDDLETON (Lancs.).—Accepted for the erection of six cottages, for Mrs. Smith. Mr. T. A. Fitton, architect, Manchester.—  
Adam Simpson ..... £785 0 0

MIDDLETON (Lancs.).—Accepted for the erection of four cottages, for Mr. T. A. Fitton, architect, Manchester.—  
J. R. Mellieu ..... £577 10 0

MIDDLETON (Lancs.).—Accepted for the erection of dwelling-house, Mellieu-street, for Mr. T. Ramsbottom, J.P. Mr. T. A. Fitton, architect, Manchester.—  
J. R. Mellieu ..... £700 0 0

MITCHAM.—For the erection of a new branch bank for the London and Provincial Banking Company, Limited. Mr. R. M. Chart, architect, Mitcham and Croydon. Quantities by Messrs. Franklin & Andrews, 95, Ludgate Hill, E.C. 4.  
Oulton ..... £2,595  
Waller, Junr ..... 2,390  
Hanscomb & Smith ..... 2,375  
Harris ..... 2,390  
Balchin & Shipland ..... 2,157  
\* Accepted with modifications.

MITCHAM.—For the erection of new house, for Mr. F. G. Sampson. Mr. R. M. Chart, architect, Mitcham and Croydon.—  
Add for red brick facings.

Balchin & Shipland ..... £1,287  
Rice & Sons ..... 1,110  
Lorden ..... 1,040  
Oulton ..... 960  
Clark ..... 920  
Burgess, Wimbledon (accepted) ..... 949  
Howe & White ..... 935

MONMOUTH.—For alterations, &c., to post-office, for the Corporation. Mr. F. A. Powell, architect, Monmouth. Quantities by Mr. Walter West.—  
D. C. Jones & Co. .... £1,106 0  
Oliver Parry ..... 998 0  
Jno. Mackie, Monmouth (accepted) ..... £677 10

MUSSELBURGH (N.B.).—For excavating and improving the bed of the river in the burgh. Mr. W. S. Paterson, Burgh Surveyor, Townhall, Musselburgh.  
Brenner & Co. .... £1,100  
Chalmers ..... 640  
Lawson & Son ..... 620  
J. Muir ..... 450  
\* Accepted.  
(Burgh Surveyor's estimate, £895.)

PETERBOROUGH.—For the erection of boundary wall, encing and gates, Cattle Market-road, for the Town Council. Mr. J. W. Walshaw, Borough Surveyor, Guildhall, Peterborough.—  
For brickwork.

J. Cuttidge ..... £390 0  
R. J. Nichols ..... 285 0  
W. Sibley ..... 285 0  
\* Accepted.

For ironwork.  
Charles Hill ..... £68 17 6  
J. Fowler ..... 45 0  
C. Rowe ..... 75 0  
Hayward & Reiffel ..... 75 15 6  
W. Miller & Sons ..... 70 0 0  
Hill, Stafford ..... 55 9 6  
\* Accepted.

PETERBOROUGH.—For the erection of two shops and houses, Westgate, for Mr. Neal. Mr. Wm. Boyer, architect, 104, Cowgate, Peterborough.  
Sibley ..... £285  
Wenlock ..... 895  
Nichols ..... 857  
Gray (accepted) ..... 798  
[All of Peterborough.]

RATHMINES (co. Dublin).—For supplying 555 tons of pipes, 12 ft. length, &c., for the Improvement Commissioners. Mr. F. P. Dixon, Engineer, Town Hall, Rathmines.  
Thos. Spittle, Ltd. .... £5,543 15 0  
W. E. Hampton & Co. .... 5,509 7 6  
McFarlane, Strang, & Co. .... 5,509 10 0  
Cochrane & Co. .... 5,425 0 0  
McLaren & Co. .... 5,461 5 0  
Cochrane, Grove, & Co. .... 5,465 0 0  
\* Accepted.  
19 ft. lengths.

REDHILL.—Accepted for the erection of new stabling at the "Royal Oak," for Nalder & Collyer's Brewery Company, Limited, of Croydon. Mr. R. M. Chart, architect, Mitcham and Croydon.—  
Carnick, Redhill ..... £293 0 0

ST. ARNICK (Cornwall).—For the execution of drainage works, for the Truro Rural Sanitary Authority. Mr. Hansford Worth, engineer, 42, George-street, Plymouth.  
W. H. Stephens ..... £2,386 14 6  
John Shaddock ..... 2,249 8 0  
Debnidge, Shipman, & Carver ..... 2,412 4 8  
E. T. Duke, Ply. mouth (accepted) ..... 2,237 18 5  
Hill & Co. (with draw) ..... £2,203 0 0

SHEFFIELD.—Accepted for baths at Upperthorpe, Sheffield, iron plans and quantities by Mr. C. F. Wike, C.E., City Surveyor, Walker & Slater, Derby.  
[Exclusive of heating by Bradford & Co., Saliford.]

SKIPTON (Yorks.).—For the construction of 2,000 yards brick and pipe sewers; also laying out 4 acres of land, &c., for the Union Rural Sanitary Authority. Mr. A. E. Preston, C.E., 14, The Exchange, Bradford.—  
Thornton-in-Craven Sewerage—Contract No. 1.

E. W. Padmore ..... £6,632 18 2  
John Bainforth ..... 6,428 18 7  
Rhodes Brothers ..... 6,242 13 7  
Arthur Bland ..... 6,078 2 0  
Henry Wilson ..... 5,893 9 4  
T. & W. Maston ..... 5,813 9 11  
S. & W. Pattinson ..... 5,648 0 0  
David Barry ..... 5,606 7 1  
H. B. & W. Son ..... 5,599 16 0  
J. & M. Hawley ..... 5,579 11 1  
Thomas Smith ..... 5,532 4 10 1/2  
B. Graham & Sons ..... 5,555 15 6  
\* Accepted.  
Street, Halifax.

SKIPTON (Yorks.).—For the ironwork required for the sewerage of Thornton-in-Craven, for the Union Rural Sanitary Authority. Mr. A. E. Preston, C.E., 14, The Exchange, Bradford.—  
Thornton-in-Craven Sewerage—Contract No. 2.

Ceo. Waller & Co. .... £436 11 0  
John & Crebbin ..... 410 10 10  
E. & W. H. Haley ..... 382 12 9  
Clay, Henriques, & Co. .... 348 6 8  
Sharpe & Co. .... 324 10 0  
Anderson Bros. & Co. .... 321 18 3  
\* Accepted.

STAFFORD.—Accepted for new bath-rooms, lavatories, store-rooms, &c., at the County Asylum, for the Staffordshire County Council. Mr. Walter H. Cheadle, Architect and County Surveyor, Stafford. Quantities by Mr. Henry Martin, of Birmingham.  
Builders' Work—Henry Lovatt, Wolverhampton ..... £493 0 0  
Plumbers' Work—Samuel Peake, Stoke-on-Trent ..... 1,425 0 0

STANLEY (co. Durham).—For the erection of four houses, for the West Stanley Co-operative Society. Mr. George Forster, architect, Stanley.  
Wm. Johnson ..... £880  
Routledge & Morehen ..... 793  
Davison & Robins ..... £745  
Davison & Cooper ..... 738

STOCKTON-ON-TEES.—For the erection of classrooms, St. Mary's Catholic Schools, for the Rev. Canon Caplin. Messrs. Wetherill & Wapman, architects, 39, High-street, Stockton-on-Teess. Quantities by the architects.  
A. J. Cooke ..... £297 14 6  
Perks & Son ..... 868 0  
Johnson & Hanby ..... 823 5 0  
J. Davidson ..... 868 0  
Treharne ..... £798 0 0  
W. C. Atkinson ..... 758 15 0  
\* Accepted.  
[All of Stockton.]

TRURO.—For the erection of business premises, New Bridge-street, for Mr. Jas. Radmore. Mr. Wm. Swift, architect, 3, Lemon-street, Truro.—  
C. & J. Harris ..... £1,435  
Moyle ..... 1,425  
Collier ..... 1,350  
\* Accepted.  
Foley & Co. .... £1,375

TWEEDMOUTH (N.B.).—Accepted for the erection of National School buildings. Mr. Wilson, architect, Alnwick.—  
Henry Elliot & Son, Berwick-on-Tweed ..... £380 0 0

WALTHAMSTOW.—For alterations at the "Coach and Horses" tavern, Mainhouse-lane, St. James-street, Walthamstow. Mr. R. A. Lewcock, architect, 83, Bishopsgate-street-within, E.C. 2.  
J. Ascelles ..... £597  
Courtney & Fairbairn ..... 594  
Burman & Sons ..... 599  
Walker ..... 595  
Toid ..... £679  
Voller ..... 730  
Green & Smith ..... 716  
Stimpson & Sons (accepted) ..... 654

WATFORD.—For the construction of a sewer and settling-tanks at Letchmore Heath, for the Watford Union Rural Sanitary Authority. Mr. Chas. Heath, Surveyor to the Authority.  
John Jackson ..... £337 0 0  
F. Dupont, Watford (accepted) ..... 347 0 0  
Surveyor's estimate, £353.

WATFORD.—For the erection of stables and coach-house, Nascot Lawn, Watford. Messrs. Pridmore & Anderson, architects, 48, High-street, Watford. Quantities by Mr. R. J. Stamp.  
Neil ..... £275  
Davenport ..... 258  
Brightman ..... 259  
Wiggs ..... £549  
Turner ..... 537

WILTHAM (Essex).—Accepted for the supply of 200 tons broken granite, for the Local Board. Mr. Harry Eversard, surveyor.—  
Croft Granite, Brick, and Concrete Co., Croft, near Lancaster ..... 22 11

WOKING.—For the erection of two pairs of cottages at Maybury, for Mr. E. Weston. Mr. William G. Jones, architect, 3, Broadway, Woking.  
Ingram & Sons ..... £1,024 0  
Harris & Son ..... 1,020  
J. Whitburn ..... 885 0  
W. J. Butt ..... 885 10  
W. R. Roake ..... £855 0  
W. Alford ..... 810 0  
G. Raggett, Woking (accepted) ..... 748 10

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W. Shepherd ..... 1 5 0  
Valde Travers & Co. .... 1 5 0  
Peter Smith ..... 1 11 0  
John Ward ..... 1 8 0  
Constable & Co. .... 1 8 0  
W. F. Chadwick ..... 1 10 0  
Thomas Lee ..... 2 3 0

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## The Christ's Hospital Schools Competition.



THE competition for the large and important new schools proposed to be built near Horsham, as the future home of Christ's Hospital, was at length decided, at a

Committee meeting on Monday morning, in favour of Messrs. Aston Webb and E. Ingress Bell, the joint authors of what is unquestionably the best plan submitted. In fact, as far as plan and arrangement are concerned, there is no other design that can be considered at all in the running with this one.

The problem, as set forth in the Instructions to architects (which were hardly as full or as precise in wording as they might have been), is a very complex one. We may briefly summarise the main demands to be provided for, taking them in the order in which they are placed in the Instructions. The residential requirements were for seven hundred boys, to be divided among fourteen houses of fifty boys each, including day-rooms, dormitories (each for not more than twenty-four or less than ten boys), sitting-rooms and bedrooms for house-master and assistant-master, studies and cubicles for two prefects, ample lavatory, bath, and other accommodation. It was suggested that the houses would be best arranged in blocks of two or three, with a matron and servants for each block; also that an alternative plan might be sent in for treating the blocks as "houses in flats." A head-master's house and six other separate masters' houses were required; a dining-hall for 700 boys, but capable of ultimately dining 820; a set of common rooms for the masters; a large kitchen with all the necessary offices, and accommodation for the kitchen staff; a clock as a prominent feature, a water-tower, and a separate block of latrines away from the other buildings. The educational portion to include a central hall, large enough to accommodate the whole school, with space for an organ and orchestra at one end, and thirty class-rooms of varying size, grouped as far as possible (except the science class-rooms) around or contiguous to the central hall. A drawing school (either a separate

building or on a top floor); science schools, with chemical and physical laboratories, and a music school; a chapel to seat 1,000; a library and museum (which might be one over the other); and a gymnasium, unless any existing building on the site could be utilised for this. There was also to be a preparatory school, treated as independent, but so far in connexion with the main school that the same kitchen could serve both; and an infirmary, divided for seniors and juniors, keeping them distinct though in the same block of building. To plan and group all these, so as to keep them sufficiently separate for sanitary conditions, and yet sufficiently in touch to secure the convenient working of the whole as one great establishment, is a pretty large problem to put before any architect.

The instructions as to drawings and design were sensible and practical, and required no more than was necessary to show the scheme of building completely. A block plan, 40 ft. to an inch; general drawings to a scale of 16 ft. to an inch, and one ground plan and one transverse section of each representative block to a scale of 8 ft. to an inch. Perspective drawings might be submitted, if thought necessary, to explain the design of any portion, provided they were truthfully and accurately made, and "kept free from any mere artistic embellishment either of drawing or colour." This last is rather a vague definition, and has been interpreted with much latitude by one at least of the competitors. Perspective drawings in outline, without shading, was probably what was intended. Competitors were warned that airiness, comfort, and healthfulness in arrangement, and solidity and "reality" of structure, were of more importance than architectural adornment. This is now always said in such cases, though we hope it is not intended to imply that the managers are indifferent to architectural beauty and dignity in school buildings.

A glance at Messrs. Webb and Bell's block plan carries conviction with it at once. It is a masterly grappling with the subject, and promises a good architectural effect as a whole, as well as the best sanitary conditions. It is a successful application of the "block system" to a school plan. On the centre of the whole plan stands the great hall, as it should, both in the architectural and practical sense, being the centre arena

of the school life. Its main entrance end faces south, and the class-rooms are grouped to east and west of it, not opening into it, but with a space between, and connected with it by cross passages in the open air, doors in the class-room corridors facing side-doors in the hall, and by a covered way at the south end, which links it with a further extension of class-rooms right and left. It is impossible that these class-rooms can all have an equally convenient light; some few of them face south, the others east and west; but this is a drawback which exists in all the plans, and is inseparable from any attempt to group class-rooms around a hall. Behind the hall is a quadrangle, on the left of which is the chapel, orientated north and south so as to present its long side to the quadrangle; on the right it is to some extent balanced by the museum and library building. At the back of the quadrangle, running east and west, is the dining-hall, and behind it the kitchen and its belongings. On each side of this great central block of buildings are placed the residential houses, in entirely separate blocks of two houses each, three on the left and four on the right, stretching out east and west, with large spaces in front of and between them, and all facing south or nearly so; the general line of frontage which they form curves backward or northward slightly as they recede from the centre. There is a general drive and some garden space in front of these; and to the south of this drive, but with a large garden space interposed, stand the separate houses for masters, each opposite to one of the residential blocks. Thus the whole forms a kind of park-like building estate, laid out in open order, and with plenty of space between the buildings. A small line sketch in perspective, on the block plan sheet, gives a general indication of the appearance which the whole group will have when completed. The medical officer's house and the infirmary are placed on the extreme right, apart from the other buildings. A fine feature in the laying out of the ground is a long avenue of trees extending to right and left along the south front line of the estate, on each side of the central entrance road, nearly parallel to the general line of the building frontage, but not following its curve, as the intention is to have a straight vista from end to end of the avenue, with an architectural alcove



or perhaps a fountain at each end of the vista. This would be a very attractive addition to the precinct of a school, and one which necessitates no great outlay. At the back of the boys' houses an open corridor of communication, not required in the instructions, is suggested as a desirable addition. The plans indicate also, if we understand rightly, the formation of a subterranean covered way for servants in connexion with the houses.

The planning of the house blocks has evidently been the subject of the greatest care, and seems admirable. As before observed they are planned in the general form H. The connecting block represents the master's portion, the entrance in the centre, and the rooms for master and assistant-master to each house, facing south, on each side of the entry; the assistant-masters' rooms nearest the boys' block, and to some extent connected with it, while the master's rooms are shut off by doors in the corridor which runs along the north side of the block. The boys are placed in the two transverse blocks at each end, their entrances being on the outside of the whole building, east and west. The ground-floor of their portion consists of lavatories and other accessory rooms at the north end and day-rooms in the south portion of the blocks; these day-rooms have windows on the outer sides but none towards the centre court, so that the masters and their visitors are not overlooked by the boys. They have also all a large south window at the end between the two angle studies. The floors above are of course the dormitories, with a detached block for w.c.'s at the north end. In the upper stories of the connecting block there are two openings in the building, not far from the internal angles, to give an opportunity for through draught of air between one courtyard and another, the passage only being carried across these openings, with windows opposite each other to open and give an uninterrupted blow through. We shall illustrate these houseblock plans to a pretty large scale, as they are excellent specimens of planning for this class of building.

The ground plan of the infirmary, with its rather difficult requirements in planning for separate entrances and waiting-rooms for juniors and seniors, with a medical department and dispensary to be equally accessible to both, is also very well managed. Upstairs, the disconnexion between the two sets of wards, in regard to cross ventilation, does not seem to be quite so complete as the instructions contemplated.

The question of architectural style is of course quite a separate matter. The general arrangement of the buildings in separated blocks precludes anything like an impressive architectural combination, though the combined view of the whole grouping from a distance will be effective. The style adopted can be judged of from the perspective drawings of some of the principal classes of buildings, which are reproduced in our lithograph illustrations. The plans we are unable to give this week, because being more or less tinted they have to be reproduced by the slower process of ink-photo; and as we had of course no opportunity of photographing any of the drawings till after the final meeting of the committee on Monday morning, at which the selection of the design was formally confirmed, we can only give this week some of these views of the various buildings as intended. We may observe that Messrs. Webb and Bell have loyally kept to the conditions in regard perspective drawings, and have strictly confined themselves to plain line drawings without any elaborations of shading or effect. But these serve quite sufficiently to show the nature of the style adopted; and also that no disproportionate expenditure has been incurred in architectural display. The style is the kind of *via media* between Classic and Gothic feeling which is almost a characteristic of the architecture of the day, with a

certain treatment which, since the Birmingham Law Courts, may be said to be characteristic of these two architects when they work in conjunction, though of course the detail is much plainer and more simple here than in the Birmingham building. We do not know that we could say it is a style that has our entire sympathy for buildings of this class; it is a little heavy, a defect which is felt perhaps more especially in the chapel design, with its low-pitched and rather ponderous-looking open-timber roof. In the plan of the chapel the aisle for the preparatory school is agreeably worked in. It is in the houses perhaps that the architectural treatment shows best, as the style lends itself better to simple treatment than to buildings where more effect must be attempted. The perspective of one of these, which is given in our illustration, shows the view of the front court with the master's door in the centre; the boys' entrance to one of the blocks is seen at the side.

We may observe that the reports which we presume each of the architects sent in with his design, were not put with the drawings for the inspection of the Press, and therefore we have gathered the intentions of each design solely from the drawings; which however are clear and precise enough to need little explanation.

As we do not wish to incur the responsibility of "placing" the other competitors, we will refer to them in alphabetical order, merely observing generally that as far as the main question of planning is concerned, for sanitary conditions and convenience combined, we do not think any of the other designs can have any pretence to compete with the selected one, which we are inclined to think will almost inaugurate a new type in public school planning. In particular we observe that Messrs. Webb and Bell have evidently kept the question of aspect constantly before their minds, as is indicated in the fact that there is not a plan in their set without the north point marked on it, while in the other designs this indication is entirely ignored except on the block plan, perhaps wisely, since systems of planning have been adopted in which questions of aspect must necessarily give way to those of architectural arrangement.

Mr. Colcutt has sent in a most elaborate set of drawings, with a plan which is the most original of the remaining four. The larger buildings are grouped round a quadrangle which forms a square of equal sides internally, while externally it branches out into promontories of building of irregular size and shape. The principal entrance faces north-east or nearly so, the entry being between the library and museum blocks which form this side of the quadrangle. This hardly seems architecturally suitable, as it is putting in the most prominent position buildings which are rather adjuncts to than an essential part of the scheme. The science and drawing schools are at the left of the quadrangle after entering, the dining-hall along the right side, and the great hall and class-room blocks on the further side, opposite to and central with the entrance. The preparatory school forms a separate block outside the quadrangle and near its north-east angle, the chapel stands separately on the opposite side of the site; the head-master's and preparatory head-master's houses are a good way in front of the main block, to left and right of the road leading to the gateway. The house blocks are arranged in five blocks standing in a semi-circle beyond and in the rear of the main block of buildings; the centre one being a block of two houses in a H shape (like those of the selected design), the other four are blocks of three houses each, in a cross form, not however, symmetrical, but with three circular blocks (for the boys, branching out from the centre, and one square block containing the masters' and matron's rooms, &c. This is a very curious and ingenious piece of planning, and appears to have been the result of a desire

to combine centralisation of arrangement with a striking architectural grouping. But we hardly think it is one to be recommended; it looks rather like the old fallacy of the radiating-ward system for hospitals come to life again. We doubt also whether a circular dormitory, especially when there is also a solid pillar in the middle (probably ventilation and warming) with beds radiating outwards from the centre, is so convenient for inspection as a long ward. On the ground floor these annexes are not quite circular, but take the form of squares with a large segmental bay on each face, being worked into the complete circle on the upper floors. On the ground floor this space is divided by a central wall into two day-rooms, looking opposite ways, and as there are three radiating blocks arranged this way they certainly cannot all be equally warm or cheerful rooms. The great hall is an octagon one 80 ft. in diameter, and rather low in proportion, with a roof which forms a kind of Tudor arch section, with skylights and an extract ventilator in the centre. We cannot like this part of this design; the hall suggests, in exterior and section, a riding-school more than anything else, and the long corridors between it and the class-rooms are not well lighted. Long and ill-lighted passages are evils in a school plan, they are convenient places for "larking" and bullying. The chapel is a nice bit of building, and the interior of the dining-hall very fine, with its massive stone arch principals with arcades filling up the space above their extrados. The music-school is exceedingly well and also effectively planned. The general style of architectural treatment is exceedingly plain—perhaps almost too much so, it looks somewhat bleak, though no doubt homelike enough in comparison with a French "lycée." There is, as might be expected, a great deal that is clever and interesting in these plans; but we certainly think the octagon shape for the large hall is a mistake, and the plans of the houses form a highly ingenious study rather than a scheme for practical adoption.

Mr. Ingelow has adopted the quadrangle scheme of plan in a more extended and complete form, as all his buildings, with the exception of the preparatory school and infirmary and one or two others necessarily kept apart, are arranged in connexion with one very large quadrangle, about 450 ft. in width, and with one walk 600 ft. long, where an arm is extended beyond the quadrangle for access to the science school. We should add that the separate dwelling-houses for masters are placed away from the main block, in a little terrace by themselves, to the north-west of the site, and seem rather too far out of the way. The corridor which runs round the quadrangle is not an open cloister but a closed one with windows. The residential houses, planned in U shape, stand a little way outside this passage and connected with it by short open arcades; they stand on the west and south sides of the quadrangle, with their return blocks facing outwards. The hall and class-rooms project from the east side of the quadrangle, at right-angles to its side; the class-rooms form a low block of buildings round the hall, and open right into it by what seems rather a primitive kind of planning. At the north-east angle of the quadrangle access is obtained to a large ante-hall which opens into the dining-hall on the right and the chapel on the left; this connexion of the two seems rather odd. The chapel runs along part of the north side of the quadrangle corridor, the dining-hall projects eastward into the open. The entrance into the quadrangle is not central, but near the north-west angle; and the head-master's house is at a little distance outside. This is, in fact, the irregular type of collegiate plan, on a very large scale. The architect has drawn out the whole 16th-scale plan in one immense drawing, so as to show the details and the whole relation of the buildings at once. On the whole we regard this as the next best plan to the selected one. The positions of the resi-



dential houses and their plans have been carefully considered, and there is something architecturally impressive in this large quadrangle, in which, on account of its extent, the sanitary objection to a quadrangle enclosure hardly applies, especially as the residential houses all face outwards. We should have preferred the corridor round as an open cloister, more particularly in a school where the boys have the hardy and healthy habit (as we believe it really is) of going about bareheaded in all weathers. The general architectural style is what may be called Collegiate Gothic; it is Gothic pure and simple, without the semi-Classical corruptions of the day. The large hall is a cathedral-like building, with lofty traceried windows, and a rich hammer-beam roof. Opposite to the entrance to the hall, standing a little apart within the quadrangle, is a clock-tower of effective design, also distinctly "collegiate" and not church-like in character.

It is natural that Mr. Jackson, with his long association with work at Oxford colleges, should have a leaning towards the old collegiate type of plan in successive quadrangles, and certainly no form of plan is more pleasant in architectural effect; and it may be maintained that, if the proportion of illness cannot be shown to be greater among Oxford and Cambridge undergraduates than among many other groups of men, there is no reason to suppose that the quadrangle plan is so unhealthy as according to theory it ought to be. For a residential school, however, for a very large number of growing boys, who are to spend a considerable portion of their early years there, some of them remaining five or six years in the school, or even longer, and who have not the long accustoms of university men, we cannot think that this is the appropriate form of plan to offer in response to a demand for a school in which healthful conditions were to be especially considered. Mr. Jackson's buildings are arranged round two quadrangles and half of a third one, opening one beyond another by central gateways. In regard to the larger buildings, however, the plan rather avoids symmetry and centralising treatment; the great hall and classrooms are approached from the right-hand side of the first quadrangle, which seems rather a sideways position for what is the principal feature of the school; it faces symmetrically the entrance to the dining-hall, which opens from the left side of the quadrangle. The chapel fills up a corner space in the second quadrangle; the music-school and science-school are in separate blocks to left and right respectively, outside the quadrangles. The arrangement of the residential houses is such as to fit them into the rather narrow blocks of building which immediately surround the quadrangles, with separate stairs interposed for each house. His leads, in the case of the day-rooms and dormitories, to rather long narrow rooms, with windows looking to the outer side of the quadrangle buildings; and the whole of each house is necessarily spread out very much in a succession of rooms in one line, not a convenient arrangement for supervision. The conditions are quite different from those at an Oxford or Cambridge college, where provision has to be made for a series of small rooms one for each man, and the form of plan which answers for one case does not answer equally for the other. On the ground floor a considerable part of the width of the building is occupied by the arcaded cloister which runs round the quadrangle, and on the inside wall, next to the cloister, are the corridors of internal communication, so that half the available space on the ground floor has to be taken up with passages; and however agreeable the architectural effect of the cloister is, it militates very much against the light and air for the interior. As the houses have to be got in on all sides of the quadrangle, of course the question of aspect is practically shelved. In short, this is an

application to a crowded school of a form of plan which is much better suited to a college for adults, though not altogether the best for that in a practical and sanitary sense. It is needless to say that the elevations and architectural treatment are admirable; the prevalent style is Elizabethan, treated with Mr. Jackson's usual refinement of design and detail. The chapel, in which a more Gothic treatment prevails, is planned on the traditional lines of a college chapel, with a lofty entrance porch or narthex the whole height of the building. The chapel has a vaulted roof (apparently wooden groining); the dining-hall has a large open timber roof. The front elevation, with its clock-tower over the entrance, is an admirable piece of school architecture, striking and dignified in general effect, and yet (as a school should be) homelike in expression. With this brief description our readers must be content, as Mr. Jackson has expressed his wish that his drawings should not be published.

Messrs. Paley & Austin have sent in a splendid set of drawings, but they would have been more successful if they had devoted to practical considerations of planning some of the trouble which they have bestowed on the production of a considerable number of charming perspective drawings showing the exterior grouping of the buildings and the interiors of the principal halls and chapel; drawings which, moreover, however admirable to look at, can hardly be considered as coming within the restrictions as to the style of perspective drawings, if any were submitted. Their plan forms an irregular and rather closely-planted set of separate buildings, the school-hall and class-rooms being in one corner of the group, which has no symmetrical arrangement of any kind. Symmetry is not a necessary quality in a plan of this kind, and it is obvious that the authors have aimed at (and realised) a fine and picturesque irregularity in keeping with the decided Gothic style of architecture adopted; but a central position for the central feature of the school we do think desirable. The residential houses are planned in rather long blocks with projecting wings, three of which are placed to the south of the main collection of buildings, and face south, the other two, identical in planning, are placed on the other side and facing north. It thus appears that to these architects the question of aspect in the residential houses for boys and their masters is a matter of no consequence whatever, and that such houses may be placed facing the sun or with their backs to it just alike. After this the general plan is really hardly worth considering; it is wrong in principle, and we do not see that there is much in the detailed arrangements to compensate for this radical mistake. The houses, considered apart from aspect, are well planned, and careful attention seems to have been given to ventilation. The interior of the dining-hall, with its large drop-arches over the coupled windows, its paneled walls and solid-looking timber roof, is a fine apartment, and the *coup d'œil* shown in the large perspective of the view of the group of buildings towards the main front makes a very striking architectural picture. But this was not the main consideration called for in the problem, which was to produce a large school which should be a model of convenient and sanitary arrangement.

LONDON STREETS AND BUILDING BILL.—In the course of the discussion on the London Streets and Buildings Bill before Mr. Stuart Wortley's Committee on Tuesday, a point in relation to the construction of party walls was raised on an amendment of the Architectural Association. In reference to the requirement that the party wall must go, not only through the roof, but 28 in. above it, the contention of the Association was that it was unnecessary to carry it through the roof. The County Council urged that this method of building was necessary as a protection from fire; and Captain Simonds, of the Fire Brigade, gave evidence in support of this view. The Committee thought the matter so important that, before deciding the point, they desired to hear further evidence.—*Daily News*.

## NOTES.



MEMORIAL has been addressed to the Secretary of State for India in regard to the important subject of the preservation of the ancient monuments of India. It is signed by the Presidents of the Royal Academy, the Society of Antiquaries, and the Archaeological Institute, and the Hon. Secretaries of the "S.P.A.B.," and calls attention to a memorial presented twenty years ago on the same subject, which recommended the classification of the monuments of India, and the employment of officers charged with the conservancy of historical monuments, whose duty it would be to visit them periodically, and to be responsible for the apportionment and expenditure of any grant the Government might make for the purpose of keeping them in repair. The present memorial states that though the classification has been made very fully for certain provinces, it is still very imperfect for others, and that the execution of repairs of buildings, and the supervision of them, has been entrusted to Public Works officers, who have none of the requisite training or knowledge. The memorial therefore recommends that "no substantial interference with monumental remains of any kind, particularly by way of restoration, should be permitted except when the proposal has the full sanction of the Superintendent of Archaeological Survey (to be appointed), through whom Collectors, Public Works officers, and others, should, in the first place, report." It is also suggested that each Government should be asked to assign in its Public Works budget a yearly sum for inspection and conservation of buildings, to be applied only after the Archaeological Surveyor has inspected the monuments, and checked or approved of the detailed estimates prepared under his instructions by the Public Works Department in each case. It is to be hoped that some attention will be paid to this recommendation. The subject is of the greatest importance to architects and archaeologists.

THE last issue of the Athenian *Mittheilungen* contains a full report of the excavations carried on since 1890 at Magnesia on the Mæander, and this will be of great interest to all those concerned with the Greek stage question, and, indeed, the structure of Greek theatres in general. The report is far too detailed to be even summarised here; it is the joint work of Drs. Humann, Dörpfeld, and Kern, and Herr Hiller von Gaertringen, who has superintended the excavations throughout. Notable features are a long inscription dealing with the building of theatres (*κατασκευῆ τοῦ θεάτρον*) specially valuable because, from the character of the letters, it is known to be of the second century B.C., and therefore dates accurately certain portions of the structure. 2nd. An underground passage, somewhat analogous to that found in the Eretria theatre, leading from behind the "scene" to the centre of the orchestra. 3rd. A very interesting inscribed monument of Hermes Tychon, remarkable because, as will be seen at once by reference to the woodcut (p. 54), it presents a close analogy to the famous Satyr *ἐνὶ τριπύλῳ* seen by Pausanias at Athens. It is an odd point that we owe our whole knowledge of this Magnesian theatre to the fact that Strabo noted an error in spelling in an inscription he read there (Book xiv., i., 41).

THE report of the Royal Commission which has been investigating the relations between employers and employed might, one would think, have advantageously embodied some of the "observations" of a minority of the Commissioners which have just been published. These, generally, appear eminently practical, and calculated to advance the cause of industrial peace without unduly fettering



either the trades unions, the employers' associations, or the administrators of the law. In the body of the report it is remarked that, as a consequence of the great rival trade organisations possessing no legal personality, collective agreements made between them are only morally binding, and are not always respected. But while the report stops here, the minority would have recommended an extension of the law relating to the status and responsibilities of such bodies. They would make each contracting association legally responsible for the observance of a collective agreement by all its members, thus giving those entering in such agreements the right to sue an association for damages in case of breach of contract by any of its members. Settlements arrived at as the result of collective action without collective legal liability are not unfrequently disappointing—the moral obligation alone proving insufficient to prevent a breach of the agreement as soon as either party feels strong enough to ignore it. It is certainly desirable to supplement the moral force by some further inducement to abide by the decisions of arbitrators and respect mutual agreements. It is pointed out that, in thus attaching a legal personality to the trade and industrial associations, actions could be brought which would render more noticeable any breach of contract, and so serve to guide public opinion. This would be a distinct advantage, apart from any damages which might be recovered. The suggestions as to these matters, and as to the powers of arbitrators, &c., are drawn up with evident caution; and the fact that they were excluded from the report is doubtless due to the Commissioners being so much impressed with the gravity of any direct legislative interference with the freedom of trade, that they hesitated to adopt these "observations" as the recommendations of a Royal Commission.

SUNDAY last was Hospital Sunday, and as the administration of the sums collected is of vital importance to the workers of the metropolis, we make no excuse for calling attention to the accounts of the fund for the year 1893. The amount received was 40,000*l.* odd, and of this sum 36,665*l.* was distributed to the hospitals and dispensaries of the metropolis and in surgical appliances. Of the balance 1,900*l.* odd is at the Bank of England, and the question at once arises why is not the whole amount which is collected, distributed, and why is a part kept for a year at a bank? The rest of the balance, 1,600*l.* odd, goes in rent, salaries, postages, &c. The salaries reach the high figure of 755*l.*, which, having regard to the fact that all that is needful is to receive and distribute the fund, appears to be excessive. This sum of 1,600*l.* is within 200*l.* of the amount awarded to the fifty-three dispensaries. Having regard to the large amount of able voluntary work done in London, it would seem that a committee and a competent clerk ought to be able to administer the money collected, and that instead of 1,600*l.* being spent in rent, salaries, and similar items, 600*l.* would be nearer the mark, which would leave an odd thousand pounds more to assist the hospitals of London at a time when the utmost help is required, and when the sick and wounded of the working population of the metropolis are in constant need of aid.

NO such melancholy event has occurred in the architectural profession for a long time past as the sudden death of Mr. Cawston from the accidental discharge of a pistol which he was cleaning. Mr. Cawston was only thirty-seven, and had already made a considerable success in his profession. His recent book on the improvement of London, though we were unable to agree with its main conclusions, gave evidence of being the work of a man of large and extended views, and great energy of mind. Only the day before his death we received a letter from him on this subject, pointing out an expres-

sion of opinion by a foreign writer on London which seemed to support his views. The circumstances of his death, however, give additional point to a lesson, constantly repeated and, unhappily, constantly disregarded, as to the folly of handling firearms, whether supposed to be loaded or not, without regard to the possible consequences in case they should be loaded. It ought to be a matter of acquired instinct, as one may say, with every man in the possession of his full senses, always to keep the muzzle of a gun or pistol, when handling it, whether he believed it to be loaded or not, in such a position that its accidental discharge could not injure himself or any bystander. Yet over and over again we have additions to the melancholy list of accidental deaths, and promising lives cut short, from the neglect of this simple precaution.

ADVERTING to a scheme that is now before the London County Council, as promoted by their Improvements Committee,\* for widening Wellington-street and the Strand, south-west corner of the crossing, we notice that a clearance has just been made at the opposite corner (east) by the demolition of some houses, also upon the Duchy Estate, being Nos. 135-7, Strand, 1-4, Wellington-street, and portion of Duchy court or place. The site, about 7,000 ft. superficial, is offered for sale; it will be familiar to those who have studied the tentative plans for a thoroughfare from High Holborn to the Strand, that have appeared from time to time in our columns, and some of the plans propose to take it for purposes of that new street. The site in question, and Wellington-street (south portion) and Lancaster-place, stand on ground which, until the erection of Waterloo Bridge and its approaches, was covered by the Savoy. The first palace on that spot had belonged to Simon de Montfort, Earl of Leicester. Rebuilt by Henry, Duke of Lancaster, it was burnt in 1381 by Wat Tyler's rebels in revenge upon its occupant John of Gaunt, and for a long period continued in a ruined state. Then Henry VII. established there his hospital of St. John the Baptist in a structure his successor completed in 1517, and built by Humphrey Cook, "king's carpenter." The hospital, illustrated by Hollar, and surveyed by Vertue, for the Vetusta Monumenta, was finally dissolved in 1702. Pennant describes the walls as standing entire in his day, 1790, and gives a view of them in his work. Fragments, in stone, of the riverside front survived at the foot of Savoy-street within our own memory; the chapel is now known as St. Mary-le-Savoy, restored by Sydney Smirke, R.A., in 1843, and again by him after the fire of 1864. Of late years the hospital buildings served for barracks, a military prison, and private lodgings. Duchy, or Dutchy, place, at foot of the spot where lay the Strand Bridge, *teste* the Ordnance Survey, separated the Savoy from Denmark (Somerset) House, and St. Mary-le-Savoy church marks its western limit. Next west stood, in Stow's day, the Earl of Bedford's earlier mansion, Russell or Bedford House, formerly the Bishops of Carlisle's "inn," extending as far as Ivy Bridge. The large cruciform structure shown in Vertue's work lay between the south end of the present church and Lancaster-place; the French Protestant chapel (1641) was situated where are now Wellington-street and Pennethorne's west block of Somerset House; north-east was the Bishops of Worcester's "inn." North and south of the same structure stood, respectively, Green Arbour-court (entered from Duchy-place) and the German Calvinistic and Lutheran churches; the latter was rebuilt and lately demolished. Lord Macaulay, in Chapter VI. of his "History of England," writes:—

In the Savoy a spacious house, including a church and a school, was built for the Jesuits. . . . It was not improbable that the new academy in the Savoy

might, under royal patronage, prove a formidable rival to the great foundations of Eton, Westminster, and Winchester.

Of that school, founded in 1686-7, and dissolved after the Hanoverian succession, an account is given in the 1754 edition of Strype's "Stow." The French Protestant Episcopal Church of the Savoy, built in Bloomsbury-street, now Shaftesbury-avenue, for the Savoy congregation in 1845-6, was designed by Ambrose Poynter: it was altered and repaired by the late R. I. Rounieu in 1869.

THE late Lord Sherbrooke said that heraldry is the only branch of knowledge that is not worth learning. In certain respects the display of British heraldry which the Society of Antiquaries have just given in their rooms at Burlington House, rather bears out this view. Old book-plates, illuminated pedigrees, grants of arms and titles, herald's resplendent tabards, the relics from above the graves of Edward the Black Prince and Henry V., the now jewelless crown said to have been made for Charles II. by Vyner and stolen by Blood\*—all these, with similar objects, may be passed over with no very serious attention. On the other hand, the society has collected a good many things of great artistic interest and merit. They showed some old cast-iron firebacks, examples (as are the railings still around St. Paul's) of a past industry in Kent and Sussex, bearing heraldic devices, [and Mr. St. John Hope's coloured photographs of the Windsor stall-plates of Knights of the Garter, Plantagenet series. The rubbings of monumental brasses are good specimens of their kind; they comprised the brass memorials of Sir Roger L'Estrange (1506) at Hunstanton, Eleanor de Bohun, Duchess of Gloucester, of Barking Abbey, in her conventional robes (1399), at Westminster, Sir Thomas Bullen, K.G., Earl of Wiltshire and Ormonde (1538) at Haver, Sir William Vernon, Constable of England (1467) and his widow, at Tong, and Sir Simon Felbrigg, K.G., Richard II.'s standard-bearer, with his wife (1416), buried in the church standing in Felbrigg Park, near Cromer, where also is Nollekens's fine bust of William Wyndham, *obit* 1810. One pedigree, however, should not be passed unnoticed, being that of a redoubtable lady, Anne, Lady Clifford, Countess-Dowager of Pembroke, Dorset, and Montgomery, daughter and heir of George, Earl of Cumberland, 1672. We are glad to find that an illustrated catalogue will be published, by subscription, of this exhibition, which closed on the 13th instant. As the present catalogue is "under revision" it would be ungracious to criticise it too closely. We noticed, though, that it contains the title "Clarencieux," several times repeated. We believe the correct spelling of the style of that "King" is "Clarencieux," as indeed it appears, both engrossed and signed, in some of the grants of arms shown in the exhibition. It is stated that the Dean and Chapter of Canterbury propose to seek advice as to the best method of restoring the surcoat, leather shield, and crested tilting-helm which are supposed to have been actually worn by the Black Prince.

THE water supply of the Penrith Urban Sanitary District has been the subject of a Report by Dr. Bruce Low to the Local Government Board. The occasion for the inquiry was local complaint to the Local Government Board respecting the public water service. It appears that the water supply of Penrith is derived from the River Eamont, which flows about three-quarters of a mile from the town. The intake is situated just above the village of Eamont Bridge. The water is piped a distance of about 600 yards, mostly through the village street from the intake to the

\* We are informed that this crown was used at all succeeding coronations until her present Majesty's, in preparation for which its stones were removed. The same claim is made for the "St. Edward's" crown in the Tower regalia, which is also described as being Charles II.'s.

\* See the *Builder* for March 17, p. 217, April 14, p. 292, June 2, p. 429, and June 9, p. 443.



pumping-station, which is lower down the stream and situated on its banks. From this station the river water is pumped, *without filtration*, to the town. The pipes are badly jointed and leak freely. That part of the village of Eamont Bridge through which the water pipes are laid comprises some twenty-six houses, containing a population of about one hundred persons. There are here eleven midden privies, some of which about upon the village street, and are situated within a few feet of the open jointed water-pipes. No sewers exist in Eamont Bridge. Slop water is occasionally conveyed from better-class houses to the river in iron pipes, the joints of which have been found leaking; or it soaks into the soil, where no pipes are provided. There are in Eamont Bridge a number of wet pigsties and cow stables as well as large dung-heaps, which contribute with the privy middens to fouling of the porous gravelly subsoil. When the mouth of the intake pipe to the waterworks is closed, water can still be pumped in considerable quantity, since the open joints of the pipes allow the ground water to be sucked in. In these circumstances, the organic impurities with which the subsoil is contaminated gain access to the water supply. In its course from Ulleswater to Eamont Bridge, the river itself receives, directly or indirectly, the drainage of several villages, mansions, scattered farmhouses, and cottages. Almost at the point where the stream issues from the lake is situated the village of Pooley Bridge, which comprises about twenty-eight houses, including a large hotel. The sewage of this village, containing water-closet discharges, is conveyed to a cesspool on the banks of the river, with an overflow discharging direct into the stream. There are several privies in the village, of primitive construction; some of them are situated within a few feet of the water's edge, and the washing of excrement from these privy pits, or the soaking from them of liquid filth into the Eamont, appeared to be easy and probable under certain conditions. Pooley Bridge village is situated about six miles (by river) above the Penrith intake. About a mile above the Penrith intake is a farm, through the centre of which flows a feeder of the Eamont, and a considerable proportion of the manure used upon this farm consisted of sludge obtained from the settling-tanks of the Penrith sewage outfall works, which are situated a short distance below the village of Eamont Bridge. The sludge from the settling-tanks is removed about once in six weeks, and sold to farmers as manure, which consists largely of human excrement. The people of Penrith have therefore for some time been exposed to the danger of having their own excrement washed from this farm into their drinking water when heavy rains or rapid thaws take place. The report concludes with the pointed question, "Are the people of Penrith to continue, in spite of all warnings, to drink water from a river which is at times seriously contaminated by human filth?"

THE case of *Barker v. Macnaughten*, which was tried last week, emphasises a remark made earlier in the year in these Notes, namely, that the London practice of putting houses and properties in the hands of several agents for sale or to let is a cause of complications and inconvenience. In the case in question a firm of house-agents sued for commission on the sale of a house. The defendant pleaded, and his defence was proved to the satisfaction of the jury, that another firm of agents were entitled to and had been paid commission. The odd part of the story was that the buyer made an offer for the house in question through the plaintiffs, which was refused, and he then gave up all intention of purchasing this house. Subsequently, he made inquiries of houses for sale from another firm, and again the same house was brought to his notice, and these agents induced him to make a

higher offer for the house, and, upon this being refused, to go yet higher, and thus to become the purchaser of it. It may be said that the case from the vendor's point of view illustrates the desirability of placing a house in the hands of more than one agent, but it seems rather to show that if a vendor places a house in the hands of one agent who is desirous to do his utmost, and this agent knows that no other one in his business has the property to dispose of, he will take much more pains than when, for all he knows, he may waste time and money in finding a purchaser, only to be informed that the property is on the point of being sold through another firm. In any event, however, the case illustrates the difficulties which constantly do and must arise when properties are in several hands, and when tenants or purchasers are introduced by two or more agents to the same property.

THE Journal of the Franklin Institute for last month contains the first portion of an instructive paper, by Mr. Wm. Paul Gerhard, on gas-burners, and the various appliances for obtaining a good and satisfactory illumination by gas-light. Assuming that consumers may, by using good instead of poor burners, obtain from 30 to 50 per cent. more light without any increase in their gas bills, the author deals at some length with the merits and demerits of various types of burners, with the object of showing how this result can be secured. The flat-flame and the round-flame burners, being those chiefly used in dwelling-house illumination, naturally receive the most attention. Among the best improved flat-burners the author reckons those of Broenner, Leoni, Sugg, Bray, and Silber, all of which are of English make except the first named, which is made at Frankfort-on-the-Main, Germany. Mr. Gerhard also refers specially to the Welsbach incandescent burners, which are now, it appears, being adopted very largely both in Europe and America.

THE Express Paint Decoration Company, of 34, Hart-street, Bloomsbury, has invited us to visit its offices and show-rooms and to examine its work. This style of decoration seems to be an enlargement and development of the system applied to transfer papers, which are familiar to all schoolboys, and is the adaptation of a patent which has been much used in France. We have before us various samples of these transfers of ornament. These are described as being produced by means of a paint printed on a specially-prepared thin lining paper. The painted side is covered over with a coat of paste such as is ordinarily used by paperhangers, then applied to the surface to be decorated; as much paste squeezed out as possible, which causes a firm incorporation and more than an adhesion of the paint to the surface. When the paste is dry, which is a question of a few hours, the lining paper is wetted with a sponge and water, and when saturated this peels off like a skin, disclosing a firm surface of paint. It is claimed for this method that it is at least 50 per cent. cheaper than ordinary work. That it is much cheaper than stencil-work or hand-painting goes without saying, and as an artistic method of decoration it may rank with stencil work, upon which it appears to be an improvement in method and expense. We should like to have some evidence as to its durability under alternations of temperature, dampness, or dryness on walls to which it has been applied, though the tests to which the process was applied in our presence were satisfactorily withstood. The process is stated to be especially adapted for the decoration of all ground work, prepared surfaces, to which may be applied friezes, borders, borders for dadoes, enrichments, and other ornamental decorations, and is suitable for wood, plaster, iron, kamptulicon, glass, and other materials.

The process should have a future before it, and this will greatly depend upon the artistic excellence of its patterns, to which the company's attention should be specially directed. The show-rooms of the company at Hart-street, which are decorated by the process, are certainly worth a visit.

THERE has lately been published in the "Transactions" of the American Society of Civil Engineers an interesting paper by Mr. James D. Schuyler, in which he describes the waterworks of Denver, Colorado. The fact that the entire water supply of a city of 150,000 inhabitants is conveyed in wooden mains is so radical a departure from all precedents that it is deserving of more than passing notice. The author states that the wood pipe having a smooth interior which becomes smoother by use, has a decidedly greater carrying capacity than a cast-iron pipe of equal diameter, the difference amounting to about 16 per cent. as far as deductions are warranted from observations covering a limited range of diameters. One of the strong features of this wooden stave pipe system is that it is built continuously in the trench where it is to lie, and not in sections made in the shop, hence it involves no difficulties in handling and transportation as with other classes of pipe. As constructed at Denver, it appears to have proved a great success, being both efficient and economical, and there is no reason why it should not be equally so in other localities where suitable timber can be easily obtained. In one case referred to by the author, a 30-in. wooden stave pipe was constructed about sixteen miles in length. It was banded to withstand a maximum pressure due to 185 ft. static head below the hydraulic grade, the bands surrounding the pipe consisting of steel bars  $\frac{1}{2}$ -in. thick spaced 2 in. to 3 in. apart.

THE recent melancholy case of the suffocation of a whole family in Glasgow from gas penetrating into the house suggests a new danger from improperly-constructed sewers, for it appears that the subsidence of the sewer had the additional effect of breaking the gas-main, thus saturating the ground beneath the house with gas, which eventually found a passage into the house in sufficient quantity to cause the suffocation of all the inmates in their sleep. The occurrence obviously points to the importance of laying gas-mains so that they should be out of danger from the results of any possible failure in other works.

IT appears that the worm, in the shape of the non-union or small-union artisan, is beginning to turn very decidedly under the crushing heel of new unionism tyranny. The meeting at Foresters' Hall, of which we give a report on another page, is one of the manifestations of this growing rebellion, and it is not likely to be the first or only one. It is a curious instance of the irony of life, that the movement which is supposed to have for its aim the emancipation of the working man should have developed into such a system of organised tyranny as to rouse the indignation and opposition of the very class who are supposed to be benefited.

ADVERTING to the fact that the British School at Athens is in great need of funds, and is making another appeal for money, the *Pall Mall Gazette* suggests that the school might take for its motto, "We can dig; to beg we are not ashamed."

WE are very glad to notice, among the advertisements for display in our columns this week, the one from University College, Liverpool, inviting applications for the position of Professor of Architecture to the College. This is an excellent step; and if, as we have every reason to hope, a good selection is made, the institution of such a professorship may have a very beneficial effect in the locality, besides forming a precedent which may be followed elsewhere.



## ARCHITECTURE AT THE ROYAL ACADEMY.—V.

THE small elevation of "A Bank and Offices" (1,672), by Mr. Greenslade, is another of the delicately-executed miniature pencil elevations of which we noticed some in our last; a building with a granite ground story and stone of two colours above, with a good deal of decorative carving sprinkled a little too freely about it; it is easy to indicate this in a pleasing manner on a very small scale, but the question is rather suggested how it would all work out on a large scale. A plan is given. We may also mention another very charming little drawing by Mr. Greenslade (1,676), an elevation in pencil of a bay of the choir of Exeter, with the bishop's throne. Mr. Prentice's "A Country Retreat" (1,675) is an effective pen drawing of a country house of somewhat Spanish manner, with a plan of house and garden attached.

Mr. G. C. Horsley's "Design Made for the Free Library and Technical School, St. Helen's" (1,678) is a solid-looking building with a strongly-marked cornice, and two tiers of plain square-headed windows with panels containing names of eminent writers over the upper windows. The main front is recessed in the centre, the street doorway coming in front of the recess. From the drawing (an ink-line drawing) it appears that the basement is of stone and the upper portion of brick. The placing of the upper and lower windows irrespective of each other and without regard to centres or piers, in parts of the front, may give character, but is not quite in keeping with the generally formal type of the building. In "Hill Wooton, Warwickshire" (1,679), Mr. J. Morley Horder gives us a pretty sketch of a country house seen through the gateway arch, and with two nicely-drawn figures in the immediate foreground. Mr. Lees' "Abbots Leigh" (1,680) is a very nice drawing of a country house with a terrace in front of it, and timber work in the gables, which has however no very marked character, and suffers from want of a plan to explain it. Mr. Spiers' "Interior of the Original Mosque, Damascus" (1,682), a charming drawing, a reproduction of which we published on February 17, 1894, in the use of the word "original" rather begs a question which may be said to be still undecided, and probably never will be decided now that the mosque is burned. In "The Church of St. Clement, Bradford" (1,683), Mr. E. P. Warren gives a sketch of a church facing down-hill, with a large flight of steps up to the double west doorways, divided by a buttress; the octagonal turret is graceful, but the buttresses against the lower portion are too much unconnected with the rest of the design, and have the appearance of being excrescences rather than necessary portions of the construction. Mr. Hellicar's restoration of "Binghams" (1,684) was illustrated in our pages under date March 24, 1894. "A Parish Hall" (1,686), by Mr. G. Kenyon, is a pretty little water-colour drawing of a simple village building of its class. Mr. W. Stirling's "Gardener's Cottage, East Burnham Park" (1,687), is more a drawing of the garden and sun-dial than of the cottage, which occupies the middle distance in a characteristic manner, a building red-tiled below and on the high roof, with white wall between, and tall plain white chimney-stacks. There is a character about this little rural building, and also about the drawing, a bold but rather raw-looking water-colour on brown paper. Mr. Nicholson's "Proposed Restoration of South Shoebury Church, Essex" (1,688) fails in interest, like some others, from having nothing to show us what is the present condition of the building, and what is the degree and nature of the restoration. It is a very artistic drawing, showing an interior with a round Norman chancel arch with a pointed wall-arch on each side, and a kind of roof-beam flat against the wall over the arch, not crossing it, with a crucifix and angels as if supported on the beam. Another church interior close to this is Mr. Spooner's "Proposed new Church of St. Bartholomew, Ipswich" (1,689), a slight but artistically-treated sketch on toned paper, showing some original treatment. The octagonal piers have no caps, the arch-mouldings of the arcade die against the centre and outer faces of the octagon, while the inner face is carried up to the roof-springing, and intercepts or mitres with a painted wooden frieze canted forward from the wall-line so as to reach the inner line of the pier. There is no plan; from the appearance of the perspective the church is designed for aisles for passage only.

Mr. Caroe's "Palazzo Notari, Ventimiglia" (1,691) is a coloured elevation of a somewhat curious-looking building, a long red-roofed block broken near one end by a raised story forming a kind of low tower, and covered with windows with grid-like shutters; there is little architectural diversification of the design except in the loggia which runs along part of it just under the roof, with colonnettes which throw blue shadows on the wall at the back; there is a marked character about this building, however, and about the colouring of the drawing. Character also there is in the small pen drawing of "Northcroft, Walton-on-Thames" (1,696) by Messrs. Niven & Wigglesworth. A finely-executed water-colour drawing of the "Congregational Church, West Hampstead" (1,697), by Messrs. Spalding & Cross, looks very like a congregational church; those who are curious in the analysis of architectural expression might endeavour to define what it is about this design which puts it entirely out of the category of possible "church" designs. The octagon centre gives it no doubt a certain congregational character, but this character is to be felt in general architectural treatment also, in which a certain secularity of style is perceptible. The building is a good one of its class, and would have been worth illustrating properly by the addition of a complete plan.

Mr. Caroe's "Test Court, Chillobolton, Hants" (1,702) is puzzling. Is it an old Elizabethan house transformed into almshouses? for that is the impression it gives. The common-looking paling running across the front of the view spoils it a good deal pictorially. Mr. Weatherley's "New Reredos for Boston Church, Lincolnshire" (1,707) is hung too high to be properly seen; it appears to be a large and richly-treated design in Late Gothic, with no very special character to remark in it, but it will suit the church very well, which is an important point. Mr. Briggs' "Design for a House" (1,708) is another of his experiments in reproducing an ancient style of house entirely, or almost entirely, in half-timber work; a plan is given, but is hung too high to be seen. The same architect's "Design for entrance and garden fronts to a house" (1,713) looks like a water-colour reproduction of a design which has been previously shown here in pen or pencil drawings, or it is an exceedingly similar one; the design is very picturesque, but, judging from the plans, it conveys rather a false impression as to scale, and is a much smaller house than it appears in the view; the staircase, in an apse which projects from the front, appears by scale to be absurdly narrow for the principal stair of a gentleman's house; the bath-room and water-closet are in the same room, a barbarous arrangement which ought never to be tolerated in a decent house, and there is a piece of entirely wasted space in the plan, behind the dining-room, a *cul-de-sac* passage. We should not have noticed these things so particularly but for the fact that the author recently read a paper on house-planning before the Architectural Association, and we should hardly look to find these defects in the plan of a house by an architect who undertakes to teach others to plan. In Mr. Arnold Mitchell's frame of "Small Country Houses" (1,710: published in the *Builder* of May 5), the plans are mostly well arranged, and the houses, though very simple in design, have the merit of being free from any affectation of the picturesque, of which we see rather too much nowadays; no doubt they owe their agreeable effect in some degree to the artistic character of the drawing.

Nos. 1,711-12 and 1,715-16 are a group of small elevations for street houses. Mr. F. B. Cooper's "Business Premises" (1,711) is a satisfactory treatment of a shop-front, with the shop-window spanned by a large elliptical arch. One can remember the time when this proper architectural and statal treatment of a shop, instead of a concealed construction standing on glass, was an almost unknown incident in street architecture; now it is happily becoming tolerably frequent. For "A Street Front" (1,712) by Mr. Scorer, there is not much to be said. Mr. H. F. T. Cooper's "Small Town House" is a neat treatment of a simple brick front with stone dressings, the windows of two of the stories grouped under wall arches, with carved panels over the lower windows; the plan is given to the same scale as the elevation, and is excellently treated in regard to the hall and stairs, but what about the light to the dining-room at the back of the house? If this is, as we are led to conclude from the way it is put on paper, a plan of a street house standing on a slip of ground of its own width, then if the next house, as usual, is arranged with its projecting block at the back the reverse way, the dining-rooms of the two would be lighted from a space between them

only a few feet in width, and the neighbours would look straight into each other's windows. "New Premises, 123, Cannon-street" (1,716), by Mr. Huntly-Gordon, is a very good and characteristic front, especially in the feature of the large third-floor window with the centre projected slightly, and the overhanging frieze running across over it. This is a much better piece of work than the same architect's "Moorgate Court" (1,709), a good and effective drawing certainly, but an uninteresting building.

Mr. John Brooke's "House, Disley" (1,717), is a very pleasing quietly-treated Gothic house shown in a delicately-executed drawing. Messrs. Simon & Tweedie's design for "Congregational Church, Heaton Moor" (1,718) is published in our present issue, and we refer the readers to the lithograph. The design is a fine piece of solid Gothic work, only the west windows seem a little out of keeping with the plain treatment of the remainder of the building. There is no plan. Balancing this is Messrs. Burnet, Son, & Campbell's "Proposed Pathological Buildings, Western Infirmary, Glasgow" (1,730), illustrated in our issue for May 19, 1894. Only a small block plan is given showing the disposition of the various buildings; a plan is of so much importance in a building of this kind that a detailed one should have been given; it is impossible to consider such a building in the mere light of picturesque architecture, though as such it is very good, and the drawing is a fine piece of artistic penmanship. Mr. Fairfax B. Wade's "St. John's Church, Whittington" (1,719, 1,720), is more interesting externally than internally; the exterior is a characteristic design, the interior somewhat too normal. Mr. Paul Waterhouse exhibits a carefully-executed coloured drawing of the oak pulpit for St. Paul's, Great Portland-street (1,722), in Jacobean style, and a rather too naive drawing (for exhibition) "Lynbrook, Stanmore" (1,723), a house in which the interesting point is the manner in which the double bay windows are combined at the angle of the drawing-room.

The "Cathcart U.P. Church" (1,725) by Mr. Rowan is a solid and massive design, rather wanting refinement in detail. "A Portion of the New Buildings at Tonbridge School" (1,727), by Mr. W. C. Jones, shows in a neat but rather hard and mechanical drawing a suitable piece of school architecture pleasantly treated. "Additions to Wickham Hall" (1,728) by Mr. Walter Millard, is another view of the house shown in No. 1,563, and already referred to. The addition we presume is the block which is projected out diagonally from the angle. All the sitting-rooms face either north or east, but as this is an addition we presume that it is not the present architect's fault. Mr. W. D. Gravel's "Design for Framlingham Grammar School" (1,729) has the appropriate appearance of a small country school.

Mr. Street's "Design for Violet Altar Vestments" (1,732) is a very successful piece of colour-treatment, in which the dark tones of the vertically-striped side hangings serve as an effective frame to the more delicate colours of the centre; a very satisfactory and pleasing piece of decorative work. Mr. W. G. B. Lewis's "Decoration of Dining-room" (1,733) looks brilliant in effect, but it is a very small drawing, hung too high to see the detail. We close with two rather characteristic drawings of small houses. Mr. Street's "House in Cleveland" (1,731) is a small water-colour of a dark-brown stone house of Elizabethan character of detail, with two bays treated symmetrically, one on either side of the entrance; original character is imparted to the front by the large heavily-rusticated arch abutting against the two bays, and taking the entrance-door under its shelter. Mr. Ambrose M. Poynter's "Design for a small Country House" (1,736) is a very characteristic drawing in light Indian ink tinting, of a house somewhat suggesting an old-fashioned country inn of the better class; the walls of the lower story of brick, the upper portion white plaster; two parallel roof ridges run up to the front, the gables of which overail the lower portion of the walls, and are decorated with dates and monograms. This agreeable and artistic little drawing forms the last number in the catalogue of the Architectural Drawings.

CONGRESS OF HYGIENE.—We are informed that a British Committee, of which Sir Douglas Galton is the Chairman and Professor Corfield the treasurer, has been formed to further the interests in this country of the International Congress of Hygiene and Demography at Budapest. Any information may be obtained about the Congress from the Hon. Secretary, Dr. Paul F. Moline, 42, Walton-street, Chelsea, S. W.



## ROYAL SOCIETY CONVERSAZIONE.

The second *soirée* this season of the Royal Society was held on Wednesday at Burlington House, under the presidency of Lord Kelvin, and there was a numerous attendance.

As usual, the exhibits were, to some extent, identical with those of the first *soirée*, but this was not so much the case as in former years. Conspicuous amongst the new ones were the excellent water-colour sketches by Mr. F. C. Penrose, including a general view of Athens in 1845; a view of the Acropolis from the south-west; the theatre of Taormina, Sicily; the cathedrals of Pisa, Siena (baptistry), Sens, St. Gudule, Brussels (window), and Winchester (north transept); the view of Sens Cathedral is a representation of its appearance before the assimilation of the western towers. The eclipses of July, 1878, and December, 1870, seem also to have attracted Mr. Penrose's attention. Altogether he showed twenty-eight sketches, the majority of which were of an architectural character. A series of sketches of clouds by the late Luke Howard was exhibited by Lady Fry; and the only other artistic representation was an oil painting of the moon, painted from actual observation. It is noteworthy, as indicating the superiority of art over mechanical processes for obtaining views of the face of the moon, as well as for many other scientific purposes hitherto considered to be sufficiently well served by photography, that this painting of the moon by Mr. Sydney Hodges was expressly done to give the precise qualities of shadow on various parts of the face, notably in the regions called "seas," because it was discovered that photography was unable to do so.

Turning to manufactured articles, the most interesting to our readers, perhaps, were those shown by Mr. C. J. Snelus illustrating the Walrand-Legnies process of steel manufacture as applied to steel castings. This process is a modification of the ordinary acid Bessemer process, the object being to make solid steel suitable for castings, and so fluid that small converters down to 5 cwt. can be successfully used, thus enabling ordinary foundries to make their own steel castings. The process consists in adding about 7 per cent. ferro-silicon, containing 10 per cent. of silicon, to the metal in the converter at the end of the ordinary blow, and then blowing again for about two minutes, at the expiration of which the temperature of the steel is increased 250 deg. Cent. Judging from specimens shown, the results are very remarkable; this process bids fair to revolutionise certain branches of the steel industry. Some of the objects, by reason of the fineness of the work (as showing extreme fluidity), reminded us more of cast iron than cast steel. Mr. Snelus also exhibited the "Triumph" weldless chain, made from best steel wire by a machine of American invention, one machine taking the wire from the coil, straightening it, and making the links and chain complete, at the rate of from 100 ft. to 300 ft. per hour. It was stated that the chain is twice as strong as a best welded chain of equal weight. Mr. Claude Vautin had specimens of metallic chromium, manganese, tungsten iron, &c., free from carbon; also fused alumina obtained during reduction of the metallic samples, the latter having been reduced from their oxides by means of metallic aluminium.

Amongst the numerous electrical exhibits we noted two contact "makers-and-breakers" for induction coils by Sir David Salomons, one of which was intended for very rapid interruptions and the other for slow. Professor Silvanus Thompson was indefatigable with his experiments with rotary magnetic fields, &c., some of which were carried out also at the last *soirée*. The electrical egg-spinning, watch-spinning, &c., were more suggestive of the conjuror, however, than of the scientist. He also showed a modified Hughes' induction balance, as arranged with one large primary coil, and two secondaries of different sizes, the use of which makes clear that the professor is well "up to date," as it was constructed for the purpose of testing for the presence of metal of any kind in alleged bullet-proof shields: such a performance is more worthy of the music-halls than of Burlington House. It is surprising that the council of the society does not exercise more discretion in selecting exhibits. The Postmaster-General exhibited a Wheatstone's automatic transmitter running up to 600 words per minute, driven by Willmot's air motor; the latter dispenses with the 42 lbs. weight which, when the instrument is running at the rate indicated, requires re-winding by the operator every few seconds. The speed of the instrument is regulated by opening or contracting the nozzle

regulating the supply of air. Mr. J. Wimshurst still had his models showing an improved method of communication between shore stations and light ships, on view. Mr. C. T. Sneekor demonstrated an electrical mode of generating heat, so as to obtain and maintain uniform any required degree of temperature, intended primarily for hospital purposes. The most striking electrical exhibit was that by Professor Elisha Gray, consisting of the telautograph, an instrument for transmitting intelligence by electricity. The writer at one station using a lead-pencil, attached mechanically to the apparatus, and writing upon ordinary paper, transmits to the distant station a facsimile of his handwriting, at his ordinary writing speed. Sketches, diagrams, plans, trade-marks, &c.—in fact, any signs or marks may also be transmitted over long distances. The instrument was in working order, and excited considerable attention.

Other instruments were the sonometer by Mr. T. P. Hawkley, for measuring the relative and comparative perception of hearing, and the calculating machine, for plain figures or decimals, exhibited by Mr. Chas. Bradbury. Mr. J. W. Swan showed some gold-leaf made by electro-deposition, instead of being beaten out by the common method; the leaves were prepared by depositing a thin film of gold on a highly-polished or extremely thin electro-copper deposit. The copper was then dissolved by perchloride of iron, the gold leaf remaining behind.

Professor Norman Lockyer still had some maps illustrating the Nile reservoir controversy, and, judging from the method of delivering his observations on the subject (which were almost word for word the same as on the previous occasion), the professor, with a little training, would make a good guide to a party round a cathedral or other public building. He has evidently told this tale about the Nile so frequently that it has become crystallised. The usual complement of natural history objects was to be seen, and altogether the exhibits were much above the average of former years.

## ROYAL INSTITUTE OF BRITISH ARCHITECTS.

At a business meeting of the Royal Institute of British Architects, which was held on Monday night at No. 9, Conduit-street, the President, Mr. J. Macvicar Anderson, in the chair, the following gentlemen were elected:—As Fellows, Mr. J. R. Naylor (Derby) and Mr. Arnold B. Mitchell, London. As Associates, Charles Spencer Haywood, Accrington; William Arthur Lewis, Walthamstow, Essex; Lionel Sargent, Wimbledon; Thomas Handy Bishop, 110, Cheapside, E.C.; Lewis Eric George Collins, 3, Lombard-court, E.C.; John Frederick Fogarty, B.E., of Bourne-mouth; Arthur Stedman, Towstower, Northamptonshire; Thomas Edward Thickpenny, jun., Bournemouth; Charles Cyril Absalom, Queen Anne's Gate, Westminster; George Smith Hill, Glasgow; Arthur John Fictor, Barnstaple; Ralph Waldo Beddingfield, Leicester; Frederick E. Coates, Sunderland; Louis Jacob, 29, Pepys-road, New Cross Gate, S.E.; James Lochhead, Glasgow; Arthur Henry Wharton Glasson, 130, Temple Chambers, Whitefriars, E.C.; George Percy Pratt, 19, Queen Anne's Gate, Westminster, S.W.; Anstis George Bewes, 19, Queen Anne's Gate, S.W.; Leonard Harris Dutch, Bolton; Joseph Charlton Maxwell, North Shields; Edward Tylee, 29, Oxford-square, Hyde Park, W.; John Fairweather, Glasgow; Solomon Ford, 3, Queen-street, E.C.; Hur Hay Livingstone Mackinnon, Aberdeen; John Anderson, Aberdeen; George Sutherland, Elgin, N.B.; Robert Andrew Easdale, Castleford; James St. John Phillips, B.E. Belfast; Henry Walter Coussens, Hastings.

## TECHNICAL EDUCATION IN THE BUILDING TRADES.

The first of a series of trade conferences to discuss the subject of technical education in its relation to the various London industries was held at the County Hall, Spring Gardens, S.W., on the 7th inst., Mr. Sidney Webb, L.C.C., Chairman of the Technical Education Board, occupying the chair. The following were the points suggested for the consideration of delegates and others taking part in the conference:—

## 1. Training in public schools.

Whether greater facilities than now exist should be offered to children to continue at school for two years after passing the sixth standard, and the nature of the instruction to be provided.

## 2. Continuation of education after entering the trade.

(a) The desirability of having technical schools for members of particular trades—e.g., carving and cabinet-making—open in the day-time, and the steps, if any, to be taken to make it possible for young apprentices to attend these schools for, say, two half-days in the week.

(b) The modifications, if any, required in the organisation and teaching of evening classes in such subjects as building construction, geometry, elementary mathematics, applied mechanics, &c., and the desirability of teaching the principles of these subjects to members of particular trades apart from other students, so as more definitely to direct the teaching into useful channels.

(c) The modifications, if any, required in the organisation and teaching of evening classes in such subjects as carpentry and joinery, brick-laying, masons' work, plastering, painters' oils and colours, &c.

(d) The best methods of combining sound instruction in principles with practical training in mechanical processes, and generally the best way of associating the theoretical class teaching with the school workshops.

## 3. Special training for those who desire to equip themselves for appointments as foremen or managers.

(a) The desirability of providing day teaching of an advanced character in a technical institute, and the nature of the aid which would be necessary to enable workmen to take advantage of such teaching.

(b) The character of the teaching to be provided, whether in day or evening classes, for foremen or managers, particularly with reference to the setting out of work, quantity surveying, the management of machinery, &c.

## 4. The manner in which the Technical Education Board can best render aid in connexion with any of the branches of teaching work indicated.

## 5. The means available for making known to members of the trades, especially to apprentices, the educational facilities provided.

Sir John Hutton, in welcoming the guests, to the number of over 100, said the object for which the conference had been called was to obtain practical opinions from those engaged in the trades connected with the building industry on the subject of technical education, in order that the Board appointed by the Council might work in accordance with the suggestions arrived at. It was necessary that some measures should be taken by the Technical Education Board to ensure the useful application of the education, and also to discover how it could be most accurately made known to all persons directly interested. He felt the greatest interest in perfect workmanship. He admired the good brickwork in many London buildings, which was a credit to the workman as well as to London. In all departments of the building trades good work could be produced, and what was wanted was to instil in the minds of the rising generation the value of technical knowledge. He sincerely hoped the day would come when all would realise that to have cheap things was to have nasty things. He, therefore, trusted that the day would come when British workmen, from their technical knowledge of their trades, and also their veneration for them, would refuse to perform what was commonly called a "scamped job."

The Chairman said the Council were trustees of a sum of money much too small for all London, and in the opinion of the Technical Education Board it was advisable to take advice from the men who could tell them from practical knowledge the best course to adopt under the circumstances.

Mr. Dilley, representing the Operative Bricklayers, said that bricklayers wished to extend their workshop practice to sanitary science, in order to be qualified to deal with the sanitary arrangements of a house. The bricklayers also wished to learn more in regard to construction—in the proper way, for instance, to construct flues so as to do what he could to prevent chimneys smoking at the wrong end. In his (the speaker's) opinion such matters should be demonstrated at the workshops, as well as bricklaying. The carpenters, the plumbers, and the metal-plate workers all had their practical examinations, while it was apparently not thought necessary to examine the bricklayer. He therefore advocated the institution of an examination for bricklayers, which examination should include sanitary science. There were registered plumbers, and he wished to know why there should not be registered bricklayers? In any examination for bricklayers he thought there should be a first grade and an honours grade, and that a man should not be qualified for a registered bricklayer until he had passed the honours grade. He also advocated better ventilation and more light and room in the workshops. He was glad



that the Board had said that where a grant was to be made a teacher should not have more than fifteen students, though he sometimes considered that number too large.

Mr. Crosier, another bricklayer, said he had found that bricklayers had no incentive to join classes, because there was no certificate to be obtained for practical bricklaying alone, though a certificate was given for bricklaying and masonry work together; it was absurd to teach them what would be of no use to them in after life. In his opinion they should return to the old apprenticeship system, and when a child was put to a trade he should learn that trade throughout, but that subsequently, when he had served his time, State protection should be afforded him.

Mr. Langley, cabinet-maker, of the London Trades Council, suggested that technical classes should be added to the School Board, as lads ought to have some elementary knowledge of the trade they intended to follow before they left school.

Mr. Adams, another cabinet-maker, said, since men who could work at all branches of their trade were scarce, the Technical Education Board should offer opportunities to young men who were working in one section of the trade to learn the whole of the trade. He thought classes would be more successful if the work of the school supplemented the work of the workshop, and if arrangements were made for a boy, when he left his work, to take up other work which would be more in the nature of recreation. As to the management of technical schools, there were many men running schools who knew nothing whatever of the subjects they professed to teach. Before any school received assistance from the Board, it should be compelled to have practical men as teachers.

Mr. Gay, Chairman of the Building Trades Association, said that his Association had been asked by the President of the Architectural Association to take part in a conference to consider the questions which were read before that body recently. Members of the building trade, in conjunction with architects, would be represented on that conference, and he had no doubt but that the question of technical education would be dealt with. In advocating a return to the apprenticeship system, he said they were desirous that apprentices should have a better knowledge of the trades which they followed, and in order to ensure this they would need the co-operation of the master builders. The speaker then urged the restriction of education in any trade to those engaged in that trade. He thought it desirable to form a committee that night in order to carry into effect one of the Board's printed suggestions, and he therefore moved the following resolution:—"That, in the opinion of this conference, it is most desirable that greater facilities should be given to apprentices, viz., at least one half day per week, whereby they may attend technical classes to receive the education necessary to enable them to become good and efficient workmen."

Mr. Ottley, of the Plasterers' Union, seconded the resolution, which was unanimously adopted.

Professor Banister Fletcher said that he should like to draw attention to the work which the Carpenters' Company were carrying on at Great Titchfield-street. There they had classes not only for carpenters and joiners, but also for plasterers, tylers and bricklayers, wheelwrights, painter-stainers, and wood-carvers. With regard to the question of admitting to a technical class only those engaged in the trade which that class related to, that was just what was being done by the Carpenters' Company. He thought, however, that that conference might help them by inducing the railway companies to grant tickets to their students at reduced prices. Some of their pupils came long distances, and the fares were rather heavy, although the fees which the Carpenters' Company were charging were light. He suggested the issue of tickets similar to those which the railway companies granted to Volunteers.

Mr. Marshall, representing the Union of Carpenters, said that the Surrey County Council had provided scholarships for boys who had passed the sixth standard and were still desirous of continuing their education in the trade or calling they wished to follow, and to facilitate this they allowed the boys four shillings a week and paid their expenses to and from the technical school at Kingston. He advocated the extension of this system, so that boys who were desirous of following a trade or learning a trade should not be bound apprentices at so early an age as fourteen years, but that they should continue for the next two years in the school, learning purely and simply

the technical branches of their trade, receiving during that time some monetary assistance. In the shop where he was apprenticed it was the custom to send a boy for two years to the drawing office before he started work at the benches; but after that he started work at the lathe and worked in each branch of the trade. That was the kind of training which was needed nowadays. He concluded by suggesting that the Board should provide the appliances which were necessary in technical schools, provided a certain number of scholars could be guaranteed.

Mr. Weighill, of the Stonemasons' Union, said that, in his opinion, unless technical education classes were closely watched and supervised, they would tend to produce unskilled workmen. He believed that boys following one trade should be taught that trade and that alone. Too often, the "handy man" was without a thorough knowledge of any one trade.

Mr. Gregory, of the London Trades Council, said they had been discussing the best means of educating the workman in his trade in order to produce good work, but it would be of little use doing so until they could create a demand for such good work. He thought the chief function of the Technical Education Board should be to give instruction in the various branches of industry of such a character that the persons following those industries would not obtain in the workshop. An employer who had a real desire to develop to the fullest extent the abilities of his apprentices would allow them to try their hands upon the best possible work; but in practice that was not so, for there was the risk of lads spoiling the stones, for instance. If there was a desire on the part of employers to help the men and to promote good education so as to make lads efficient workmen, they should make a small sacrifice in order to allow their apprentices or boys to attend the classes which the Technical Education Board were forming.

Mr. F. T. W. Goldsmith, Hon. Secretary of the Architectural Association, thanked the chairman for his invitation to speak, and said he wished to make one or two remarks in reference to clause 4 on the paper containing suggestions for the consideration of delegates, viz., that dealing with the manner in which the Board could best render aid in connexion with any of the branches of teaching work indicated.

A great number of members of the Architectural Association desired that the architect, as an artist and a craftsman, should be brought more in touch with the workman—with the man by whom his designs are carried out, and who should readily understand what the architect desired done. It was most desirable that the workman should more thoroughly understand what the architect expected of him, and it was for the benefit of the workman that he and the architect should become personally acquainted in the execution of designs. He believed in the idea of apprenticeship, and the Architectural Association having started, trusted to be able to carry out the proposed association of workmen and architects, which had been referred to by Mr. Gay. The scheme would not be prejudicial to the workman's interests, nor would the proposed workshop training infringe any trade rights. The Association was endeavouring to initiate a movement calculated not only to benefit its students, but artisans as well. They desired to place within the reach of architectural students opportunities for gaining practical knowledge in the workshops, supplementary to the instruction which he gained in the classes and studios of the Architectural Association. Their idea was that some time during his studentship the student should be drafted into a practical workshop to get experience of its workings, to work out designs, to learn the limitations of various materials by working with his own hands, and to come into direct contact with the workman. He considered that their object would best be accomplished by affiliating to itself, as a preliminary step, the workshops of the Guild and School of Handicraft, which would, he trusted, be only the beginning of a larger and more comprehensive movement, and their desire was that students should have practical teaching from skilled artisans in ironwork, carpentry, joinery, wood-carving, hammered and chased metalwork, hollow ware, work in precious metals, enamelling, work for constructive purposes in wax, clay, plaster, and, if circumstances permitted, in stone-masonry and carving. These considerations would be given effect to by practical workmen, and the teaching would be conducted less in the form of classes than by direct personal supervision from the artisans skilled in the different crafts. The Association was too poor

to give effect to these proposals single-handed, and they wanted the Technical Education Board to come forward and assist them: they wanted the Board to help them make the workman more of an artist and true craftsman, and bring the architect in closer touch with the workman, so that work should have the best qualities of a joint production, being then the product of the workman and the architect. As one result of this, better work would be done and more sympathy would exist between the workers, and in time, he thought he might venture to repeat the words of a former speaker, the workman would refuse to do scamped work.

Mr. H. Holloway, Master Builders' Association, said the great danger likely to arise in regard to popularising technical education was the possibility of youths and young men attending the classes and getting a very superficial knowledge of the trade and then posing as accredited mechanics and thereby flooding the market with inferior and unskilled workmen. His own idea was that technical schools might rather limit actual teaching in handicraft in favour of the more theoretical instruction in general principles of building construction. They should not so much aim at teaching a boy how to cut a mitre, for instance, as to teaching him the general principles of how work should be done. Such knowledge as that would be of great advantage to a young man learning a trade, for it was knowledge which could not be acquired in a shop. The instruction given in the shop would give him a knowledge of all the mechanical details which he would require, but the technical schools should seek to supply the more general principles—principles, though, which should not be confined to mechanical work, such as might be performed by the hand, but to a knowledge of the nature and the component parts of materials he was to use and the effect of one kind of material upon another; so that a man, when he proceeded to work in his trade, would have an intelligent idea of the material he was working with. Then, again, it was not altogether a disadvantage in the schools for a man to have a general idea of the other trades that were taught. Supposing a boy was an apprentice to a bricklayer, and he went into a bricklayer's class, he (the speaker) could see no reason why he should not have a general knowledge of masonry, so that he might know how the work and material of one trade might affect the other. He thought they might go further, and in the schools give instructions in art itself, so that a boy might have an idea of the beauty of the thing he was to produce, and in that connexion there was no reason why the Board should not encourage lectures in art and obtain the services of some of our architects to give instruction, so as to advance a capacity for appreciating correct architecture. He believed that the crux of the whole matter rested upon apprenticeship; but he should like to point out that not long since some trades unions took up the position of opposing the increase of apprentices, because they said such an action would tend to flood the trade with too many men. He believed that most of the best employers in London had always been ready and willing to accept apprentices so far as they could. His firm had always desired to do so, and at the present time they had something like twenty apprentices in their employ. As to the half-day in the week for technical instruction for apprentices, on behalf of his firm he would be glad to grant the half-day if such classes were formed. In fact, already they made it a condition that a boy should attend twenty-five lessons during each year of his apprenticeship in a building construction class, but the chief difficulty with regard to apprentices was that of money. Working men and men of the artisan class would not apprentice their children unless some wage was given by the employer; but since a boy was worth very little when he first entered a workshop as an apprentice, it was not to be expected that the masters should pay them any or but little wages for the first year or so. Could the Technical Education Board, like some of the City Companies, do anything to assist in that direction? That Conference was bound to do good, and, speaking on behalf of the Master Builders' Association, he most heartily sympathised with the efforts that had been made.

Mr. Howard, of the British Institution of Wood Carvers, Mr. Crick (who suggested the desirability of using Board schools for the purposes of technical education), Mr. Wilkinson (who said that while he much desired to see the system of apprenticeship re-established, he thought the system of premiums associated with



that matter should be abolished. There were a good many conscientious builders, and some of them, he believed, would be quite willing to take boys into their shops and apprentice them for five years without any premium; and Mr. Crockett, of the Amalgamated Cabinet-makers, and others, took part in the discussion, in most cases merely confirming the opinions expressed by previous speakers.

Mr. Owen Fleming, of the Architectural Association, said he felt that they should do something practical, and unless they had the advantage of the active co-operation of practical men, the work might assume a too theoretical character. He should like to indicate what was proposed by the forthcoming conference. Their idea was that the conference should consist of representatives of the Institute of Architects, the Architectural Association, the builders' associations, the trade unions, the Technical Education Board, the London School Board, and the Polytechnics, and that it should become a permanent committee to watch over the education of the working-man, and to see that it was carried out on a practical basis. The first thing to be done by that committee would be to put themselves in communication with the building trade unions, and to endeavour to arrive at an understanding as to whether a man should possess a minimum amount of knowledge in order to be eligible for election to his union.

The Chairman said he was sorry to interrupt Mr. Fleming, but the questions he was dealing with could hardly be gone into at that occasion.

Mr. Fleming deferred to the Chairman's ruling, and said he would conclude by hoping that what the committee to which he had referred made suggestions to the Technical Education Board the Board would give those suggestions the consideration which they would deserve.

The Chairman said he should like to point out that with regard to what Mr. Marshall had said about starting junior scholarships for children leaving school and paying them £10 a year to continue their training, the Board had already given away 500 such scholarships. Unfortunately working men did not seem to be aware of what the Board was offering in the way of art exhibitions and scholarships, and one of their difficulties was in making known the facilities which existed. With regard to the practical suggestions which had been offered, every effort would be made to get them carried out.

A vote of thanks to the chairman concluded the proceedings.

## THE BUILDING AND ALLIED TRADES OF LONDON:

### CONFERENCE OF WORKING MEN.

A SPECIAL general conference of representative working men connected with the building trades, under the auspices of the National Free Labour Association, took place on Wednesday evening, at the Foresters' Hall, Clerkenwell-road, E.C., for the purpose of taking into consideration "the present tyrannical action of the Building Trades' Federation, and also to protest against the continued action of the Works Committee of the London County Council in refusing to employ non-union and free-labour men." Mr. E. Maskall, Secretary of the Fibrous Plasterers' Association, occupied the chair, and there was a large number of representatives and delegates present.

Mr. W. Collison, the Secretary of the Association, read letters from Lord Rosebery, Colonel Ford, Dr. G. B. Longstaff, L.C.C., Mr. R. E. Antrobus, L.C.C., Dr. Bott, L.C.C., Mr. Henry Clarke, L.C.C., and other councillors, who undertook to give the matter of London County Council employment their attention. Lord Rosebery's communication was simply an acknowledgment of the Secretary's letter.

The Chairman said the resolutions which were to be considered had for their object the removal of serious disabilities under which the vast majority of workmen connected with the building trade was now suffering. The members of the larger unions of the building trade only numbered 15 per cent., while the other 85 per cent. were members of smaller unions, or non-unions, and yet this handful of workmen, simply because they were organised, had for many years past been dictating terms to the whole of the trade, masters and men alike. The first resolution on the agenda dealt with the arbitrary conduct of the Building Trades' Federation, and after the speeches of the evening he did not think there would be much doubt in the mind of the public as to the existence of a sort of reign of terror which the Building Federation had produced among builders' workmen. The second resolution dealt with the action of the Works Com-

mittee of the London County Council and of their practices. The Committee, who had denied their statements, were completely under the thumb of trade unionists, but he thought it would puzzle them to explain away the proofs of which the Association was in possession. It seemed there were two passports into the employ of the London County Council: first, a workman must have a Progressive Labour Member to say a good word for him; secondly, he must be a trade unionist, for not to be able to repeat the Shibboleth of unionism would be a fatal objection. There was present that night a non-unionist London County Council foreman. This man had committed the unpardonable crime of throwing over trade unionism, and his comrades were endeavouring to force the London County Council to discharge him. Day after day deputations of wrathful workmen had waited upon members, and urged that the man should be dismissed, otherwise they threatened that they would all come out on strike. If this was not coercion, they had yet to learn what was. The British workman, whether he be a unionist or non-unionist, had a right to live, and the wives and children of free labourers demanded bread quite as much as those of the unionist. That the Works Committee of the London County Council was mainly constructed to catch the labour vote there could be no doubt. Instances had been mentioned publicly in the Council where certain Progressive labour members had sent men in their names to the manager of the Works Department to apply for work, and it was therefore nothing to be wondered at that there were already influences at work which found employment on the Council for whole families, and that certain men were predestined by somebody to become foremen and to occupy responsible positions whether they were competent for the posts or not. As a ratepayer he contended that he had a perfect right to a job whether he belonged to the union or not.

Mr. F. Wheeler, Secretary of the Independent Carpenters' and Joiners' Protection Society, moved the first resolution, which was as follows:

"That in the opinion of this Conference, the present coercive policy of the National Association of Operative Plasterers; the Operative Bricklayers' Society; the Amalgamated Society of Carpenters and Joiners, assisted by the officials of the Building Trades' Federation, in endeavouring to crush the Fibrous Plasterers' Association; the London Slaters and Tilers' Society; the Independent Carpenters and Joiners' Union; and the Metropolitan Society of Painters and Bricklayers and boycotting their members, is most unfair, and strongly to be condemned, and this Conference pledges itself to obtain, by all means in its power, fair play for the members of the above Unions."

Mr. Wheeler protested against the coercion of the unionist men, and remarked that even his own brother, who was a unionist, dare not give him (the speaker) work, because he was not a union man. He also expressed his determination to assist in abolishing the federated ticket.

Mr. W. Davey, of the London Slaters and Tilers' Union, seconded the resolution. He complained of the tactics of the Operative Bricklayers' Society, and remarked that not one out of twenty bricklayers knew anything at all about roofing-tile. No one trade had a right to say who should or should not do any particular kind of work so long as those who did it got the recognised standard rate of wages, and the party who paid for it was satisfied. The bricklayers, above all others, ought to hide their faces in a matter like this, seeing they encroached upon the preserves of every trade in the building line.

The resolution was also supported by Mr. S. Wakeham and Mr. Tyler, and carried unanimously.

Mr. G. A. Green, of the Independent Carpenters' and Joiners' Protection Society, next moved

"That the representatives of various sections of labour connected with the building and allied trades, now assembled, strongly protest against the tyrannical and arbitrary conduct of the Works Committee of the London County Council, in refusing to employ non-union and free labour men."

He said he had been in the trade twenty years, and yet a union man with a few years' experience would get a job from the London County Council before him. If trade unionism was such a grand thing, why was it that it did not commend itself to the majority of the working men of the country. He had been badly treated because he did not possess a ticket. Trade unionists were always saying the masters were the tyrannisers, but he contended it was not the masters but the trade unions. As long as a man

was a competent worker he had a right to work for anybody without being interfered with, and he hoped that by such an organisation as the one proposed, masters and men would be able to meet each other in a conciliatory spirit.

Mr. A. Morrison seconded the resolution.

Mr. F. J. Rogers, Treasurer of the National Free Labour Association, in supporting the resolution, said it was nothing less than a national disgrace that a man should be persecuted because he did not possess a Federation ticket. It was a sort of unwritten law that a man had no chance of obtaining employment from the County Council unless he could produce his ticket. He had written to Mr. Holloway, Superintendent of the Works Department at Belvedere-road, on the subject, and had received a reply saying that no distinction was made between union and non-union men, but in the concluding sentence of the letter he added a remark to the effect that he could not tell what his foreman did. For every one non-union man employed by the County Council there were fifty or sixty union men. He (the speaker) honoured the few who had sturdily refused to accept the ticket of the County Council. Mr. Rogers then read a statement made by Mr. J. Moore, in which it was mentioned that in March, 1894, he applied at Belvedere-road for a job as general manager. After some conversation he was asked by the manager whether he belonged to the Building Trades' Federation, and whether he agreed with their principles, and on answering each of these questions in the negative, the manager told him that there was no work for him, and that there was no use of his applying for work.

Mr. Moore corroborated the written statement, and said he meant to do his utmost to put a stop to such practices.

The resolution was carried unanimously.

Mr. Beal, carpenter, then proposed the following resolution:—"That this meeting, representing all sections of labour connected with the building trades, in consequence of the tyranny of the Building Trades' Federation, recognises the imperative necessity for the immediate formation of a central governing body or association, consisting of and formed unitely by the various independent unions and workmen connected with the building trades, and further instructs the joint committee of this conference, by the formation of an employment bureau, and by any other means it may think fit, to carry into effect the foregoing resolution."

Mr. George Morris seconded, and Mr. Joiner supported the resolution.

Mr. W. Collison said that if the resolution were passed a private conference of the joint committee and delegates would be held next week, to frame the rules of the new organisation. It was suggested that it should be called "The United Building and Allied Trades Council," and that the Council consist of delegates from the various independent unions at present in existence. One of the leading departments of the Council would be a conciliation board, consisting of representatives of each section of workmen, and an equal number of employers, and the board would be empowered to settle all disputes as to rate of wages, hours of employment, and any other questions which might arise. They would also establish an employment and registration office, and in six different parts of London they would take the registered names and addresses of capable and efficient workmen who were prepared to enter their names and fight against the tyranny of the Building Trades' Federation. Their intention was to break down the federated ticket, and those who had taken the matter in hand were going to succeed. He had no doubt that they would be supported by most of the master builders giving the men preferential employment provided they were capable and efficient workmen.

The resolution was carried by acclamation.

Mr. Chandler, President of the National Free Labour Association, moved the last resolution—

"That a deputation be appointed to wait upon the London County Council in order to draw attention to the practices complained of, the deputation to consist of the joint committee of this conference, together with workmen who have been refused employment, and that the Secretary be instructed to make such arrangements as are necessary to carry into effect the foregoing resolutions."

He was quite sure they would break down the federated ticket, just as they had done with unskilled labour.

Mr. Ellis, London and North-Western Railway Works, seconded the resolution, which was also carried unanimously.

A vote of thanks to the chairman concluded the proceedings.



## Illustrations.

## "PROS OLYMPON": FRIEZE.

THE subject of the Frieze, No. 1,571, Royal Academy, is, of course, suggested by Homer, book i., line 494—  
 Καὶ τὴν δὲ πρὸς Ὀλύμπῳ ἰσχυροὶ αἰὲν ἰόντες  
 Πόντος ἄνα, Ζεὺς δ' ἠΐνα.

The twelve chief gods, male and female, excepting Hestia (who does not quit the celestial abodes), float towards Olympus, the place of Hestia being filled by Hebe, daughter of Zeus and Hera, who is generally associated with the great gods.

As regards this class of subject, Mrs. Jameson has well remarked:—"We have all some abstract notions of power, beauty, love, joy, song, haunting our minds and illuminating the realities of life; and if it be the especial province of sculpture to represent these in forms, where shall we find any more perfect and intelligible expression for them than the beautiful impersonations the Greeks have left us? It is not the sea-born Venus, but beauty and love; it is not the vine-crowned Bacchus, but joy and fertility; it is not Athena, with thoughtful brows beneath her helmet andegis-guarded bosom, but womanhood armed in chastity and wisdom, which stand before us; with these have we not sympathies strong, and deep, and pure?"

This, written by one who herself profoundly appreciated other and later symbolism, seems equally to hold true of decorative figure-subjects in painting, and expresses the feeling with which they must be regarded.

J. S. BABB.

## DESIGN FOR CONGREGATIONAL CHURCH, HEATON-MOOR.

THESE plans were submitted in a limited competition, but were not placed by the Committee. The church was planned to occupy a corner site in conjunction with an existing hall, which was to be enlarged and connected with the new building. The church was to accommodate 600, without galleries, and with the usual vestry and other accommodation. The estimated cost was to be about 6,000*l*.

The design is by Messrs. Simon & Tweedie, of Edinburgh, and the drawing is exhibited at the Royal Academy.

## BUILDINGS FOR THE NEW CHRIST'S HOSPITAL.

We give illustrations of four of the buildings which will form part of the new Christ's Hospital Schools at Horsham, as designed by Mr. Aston Webb and Mr. Ingress Bell, whose plans have been accepted in the competition. The subject is further referred to in the first article of the present issue. As mentioned there, the instructions specified that perspective drawings, if sent, should merely be such as to show the facts of the building, and not worked up with any "effect." This accounts for the very simple and unadorned character of the drawings, which, however, show very clearly the style of architectural treatment intended.

## THE LONDON COUNTY COUNCIL.

THE usual weekly meeting of the London County Council was held on Tuesday at the County Hall, Spring-gardens, Sir John Hutton in the chair.

*The London Streets and Buildings' Bill.*—Dr. Longstaff, Chairman of the Building Act Committee, in bringing up the usual report of that committee, said that with regard to the London Streets and Buildings' Bill now before Parliament, 108 clauses out of 200 had been passed, and Parts I. to III. and V. to XI. of the Bill had also been passed, a few clauses being reserved. Part IV. had been adjourned.

*County Surveyor.*—The first paragraph of the Bridge's Commission was as follows, the recommendation being agreed to:—

"We recently drew the attention of the Council to the necessity of appointing a surveyor of county bridges under 13 George III., cap. 78, and 43 George III., cap. 59, for acquiring lands and for other purposes in connexion with the rebuilding of Lee Bridge, and acting upon our suggestion the Council appointed its chief engineer as county surveyor for that purpose. Since then we have considered whether it would not be advisable for the Council to formally appoint a permanent

county surveyor, and to set out all the duties he would be called upon to perform. In the first place it appears that the Local Government Act of 1888 has transferred from the Justices in Quarter Sessions to the Council the power of appointing, removing, and determining the salary of the county surveyor. By the Statute of Bridges, 22 Henry VIII., cap. 5, power was given to the justices to appoint two surveyors who should see that decayed bridges and the highways at each end for a space of 300 ft. were repaired from time to time, and the justices had power and authority to allow reasonable cost and charges to the surveyors. By the later Acts before referred to, the surveyor has to give notices and to make offers connected with the purchase of land for the widening of bridges. By section 79 (2) of the Local Government Act, 1888, the Council apparently would have to sue and be sued for damage done to county bridges in the name of the surveyor, as it is provided by that section of the Act that all the duties and liabilities shall become those of the council of the county. The surveyor is also to superintend and inspect the erection of county bridges, and to give certificates in certain cases as to the sufficiency of bridges before they can be declared county bridges. He has certain powers conferred upon him for obtaining stone, gravel, and material, and for the prevention of obstructions, nuisances, and annoyances. The other duties of the surveyor are connected with main roads. As this is a matter which is under the control of the Highways Committee, we asked them for their views on the subject of appointing a county surveyor, and they concur in our opinion that such an official should be appointed by the Council. The provisions of the Highways and Locomotives (Amendment) Act, 1878, with respect to main roads under the Local Government Act, 1888, now apply to London, and various duties are cast upon the county surveyor, such as to give certificates in cases of excessive weight or extraordinary traffic on main roads, and to report whether the roads have been properly maintained and repaired. For the purpose of the maintenance, repair, and enlargement of the main roads, the Council has the same powers and is subject to the same duties as a highway board, and it also has the same powers as a highway board for preventing and removing obstructions. The surveyor under these provisions has certain powers of getting stones and materials from waste and other lands and duties for the removal of obstructions and other matters. The engineer of the Council has been performing all the duties connected with main roads, and has had under his care all the county bridges, but he has not been formerly appointed county surveyor. We have consulted Mr. Binnie, the chief engineer of the Council, and have ascertained from him that he is willing to be appointed county surveyor, and to undertake the duties which attach to the office, should the Council think fit to appoint him. We recommend:—

"That Mr. Alexander Richardson Binnie, as the chief engineer of the Council for the time being, be appointed county surveyor for the administrative County of London, to perform on behalf of the Council all such duties as may pertain to the office."

After transacting other business the Council adjourned soon after seven o'clock.

## COMPETITIONS.

*CHRIST'S HOSPITAL.*—The committee of judges appointed for that purpose have on various occasions thoroughly considered the drawings submitted by the architects who were requested to send in competitive designs for Christ's Hospital new boarding-schools; and they have reported to the Council of Almoners that in their opinion each of the designs is of exceptional merit and power. They are unanimously of opinion that the design submitted by Messrs. Aston Webb & E. Ingress Bell most closely fulfils the instructions, that it is the best in point of arrangement, the cheapest to carry out, and is on the whole the most suited for the Hospital's purpose. They have accordingly made their award in favour of Messrs. Aston Webb & E. Ingress Bell. The other competitors were Mr. T. G. Jackson, A.R.A., Messrs. Paley & Austin, Mr. T. E. Colcutt, and Mr. B. Ingelow (Carpenter & Ingelow), each of whom receives a premium of 400*l*.

*SCHOOL EXTENSION, WALSALL.*—The plans of Messrs. Bailey & McConnell have been selected in competition for the extension of Queen Mary's School, Walsall. The proposed additions include the extension of the Girl's High School, a laboratory, workshop, and gymnasium for the schools, and also board-room for the Governors.

*NEW ART GALLERY, READING.*—Some time ago the Corporation of Reading invited the local architects to submit designs for a new Art Gallery and extensions of the existing Free Library and Museum Buildings. At the Council meeting held on the 7th inst. a report from a committee

of the whole Council was brought up recommending that the authors of the design sent in under motto "Art and Antiquities" be awarded the advertised premium of 50*l*., and be appointed architects to carry out the works. It was also recommended that the author of the design "Randingia Hoc Fecit" be awarded the sum of 20 guineas. After some discussion the report was adopted, and the sealed envelopes were opened, and the Mayor announced that the design "Art and Antiquities" was submitted by Messrs. J. J. Cooper and W. Roland Howell, A.R.I.B.A., of Reading. The recipient of the second premium is Mr. W. G. Lenton, also of Reading.

## ARCHITECTURAL SOCIETIES.

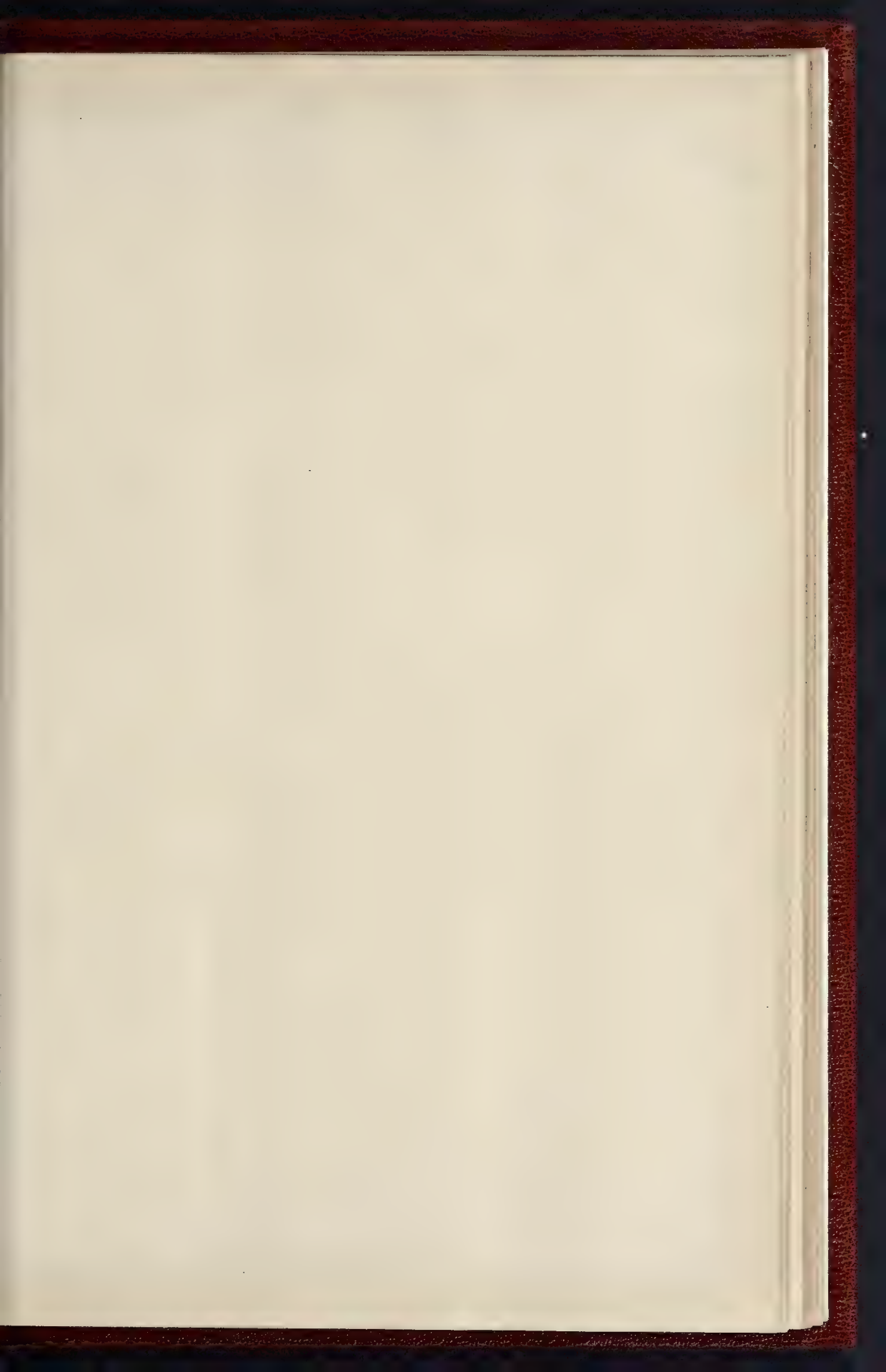
*LINCOLNSHIRE AND NOTTINGHAMSHIRE ARCHITECTURAL SOCIETY.*—On the 6th inst. the annual excursion of the Architectural and Archaeological Society for the counties of Lincoln and Nottingham took place in the neighbourhood of Horncastle, a number of Lincolnshire churches being visited. A start was made shortly after half-past nine o'clock in the morning from the Bull Ring at Horncastle. Ashby Puerorum Church was first inspected, and afterwards a brief visit was paid to Somersby. A Perpendicular church at Salmonby attracted some attention. The party further visited the ecclesiastical edifices at Tetford, Ormsby, Harrington (where luncheon was partaken of), Bag Enderby, Hagworthingham, Lushby, Bolingbroke, Mareham-on-the-Hill, and Scrybsby. On arriving at Horncastle the members assembled in the Corn Exchange to hear a paper on "Some Ancient Records relating to the Manor of Langton and its Lords," by the Rev. W. O. Massingberd, the Rector of Ormsby. The Rev. J. Conway Walter, the Rector of Langton, who acted in the capacity of hon. local secretary, read a paper on "The Neighbourhood of Horncastle and some of the Inhabitants thereof in a Bygone Age." The annual dinner was held in the evening.

## Books.

*The Oxford Museum.* By HENRY W. ACLAND, M.D., and JOHN RUSKIN, M.A., from original edition, 1859, with additions in 1893. London and Orpington: George Allen, 1893.

THIS is a rather melancholy little review. It consists of the letters of Mr. Ruskin about the principles of art to be followed in the designing and decoration of the Oxford Museum, written during the time when it was firmly believed that the glorious Middle Ages were to return—architecturally speaking at least—and that Oxford Museum was to be the first fruits; a building in which the inspired artisan was again to carve his own capitals direct from the teaching of Nature, without the interposition of working drawings, and a building was to arise which would sum up all the love and enthusiasm of the revived Medievalism. And now, alas! we have changed all that; the Oxford Museum indeed still stands, but the enthusiasm is no more; the building is regarded by some sardonically, by others indulgently, as a well-intended but rather grotesque mistake. And how certain everybody was at the time, too! It is sad but, perhaps, instructive reading, these old enthusiasms warmed up and re-issued to a generation which is entirely taken up with its own new ones. Let us take the lesson, and remember that a generation or two hence our enthusiasms may seem as old as these now do to us.

There are some good things in the letters; it is not worth while to go into them, for where they are true they are what every one accepts, and where they are not it hardly matters now. They are "ancient history." The capital carved by O'Shea, the Irish carver brought over by Mr. Woodward, the architect, from British ferns, which is engraved as a frontispiece, is a pretty and refined bit of work, at least as shown in this very delicate engraving. Good also is the story (in the new portion of the book) about O'Shea and the master of the University. It may be remembered that Fergusson is very satirical about the Medieval cats and other animals introduced as ornament to the building, "to illustrate the fauna and flora of our planet"; Fergusson could not see why these should not be like the







THE DANCING FOUNTAIN, 1894

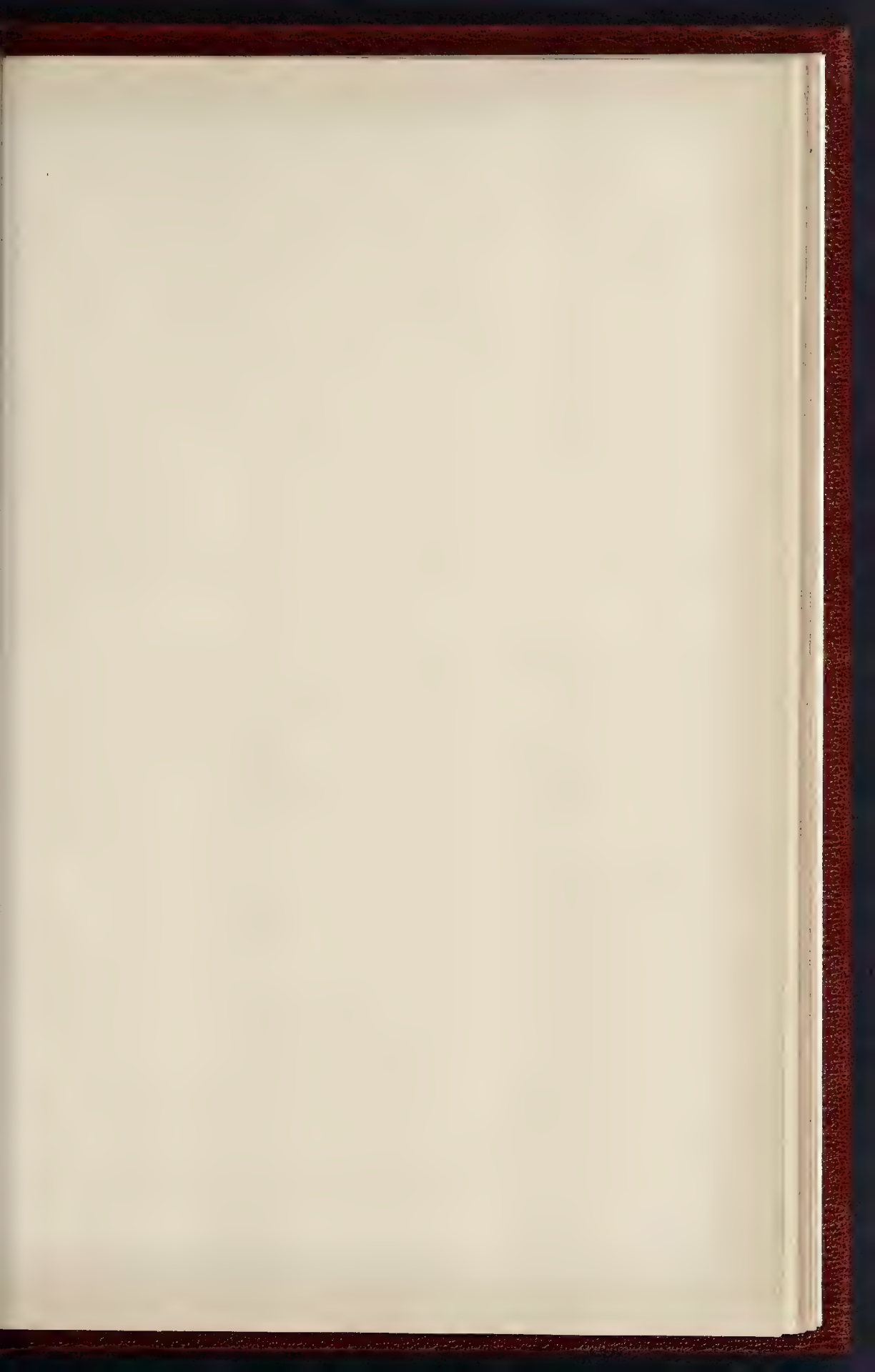
THE BUILDER JUNE 16 1914



"PROS OLYMPION": FRIEZE—DESIGNED BY MR. J. S. FARR.













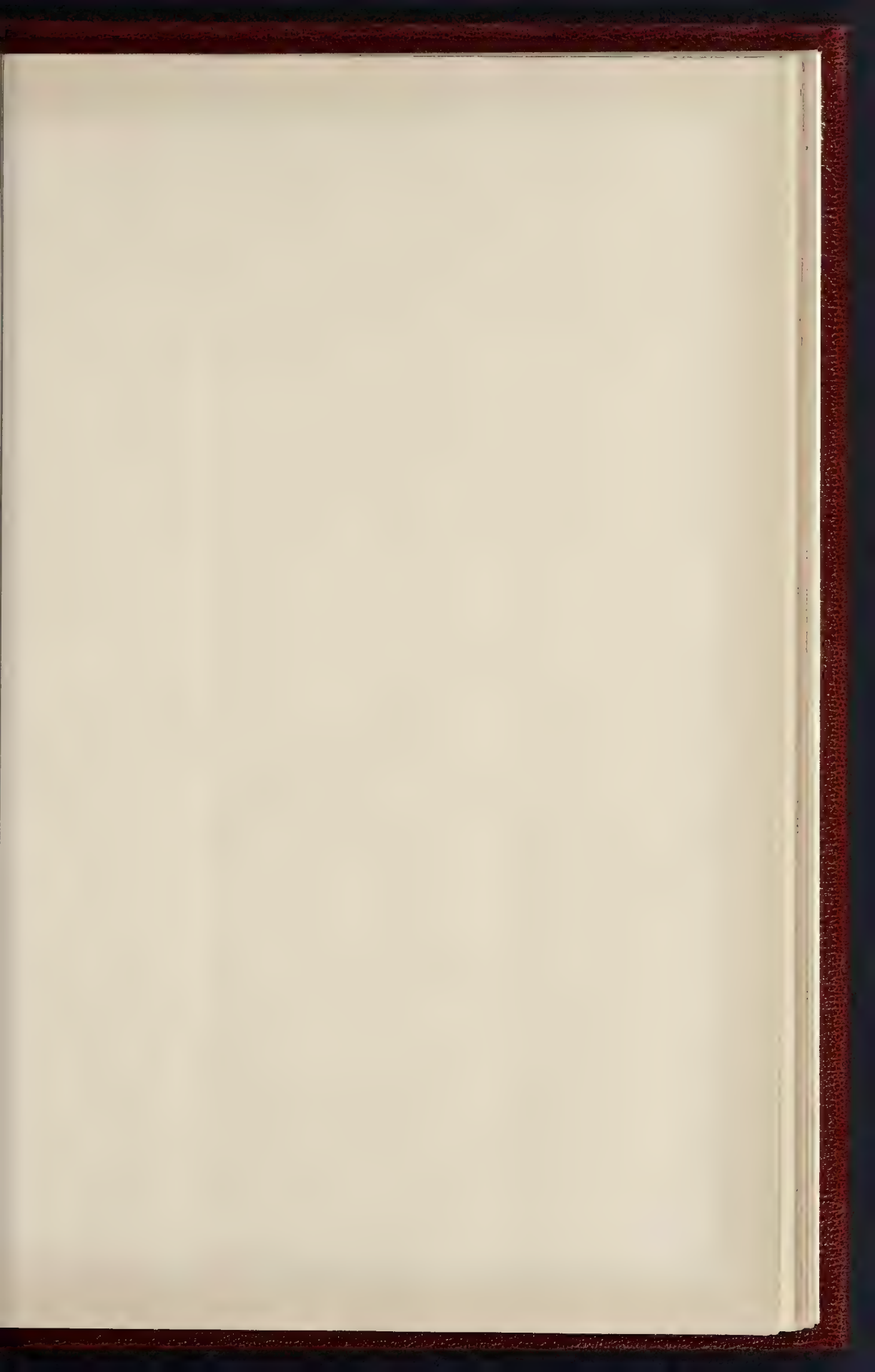
penitive Design \*

Frank W. Simon & Treadle Arch<sup>ts</sup>  
Edinburgh.

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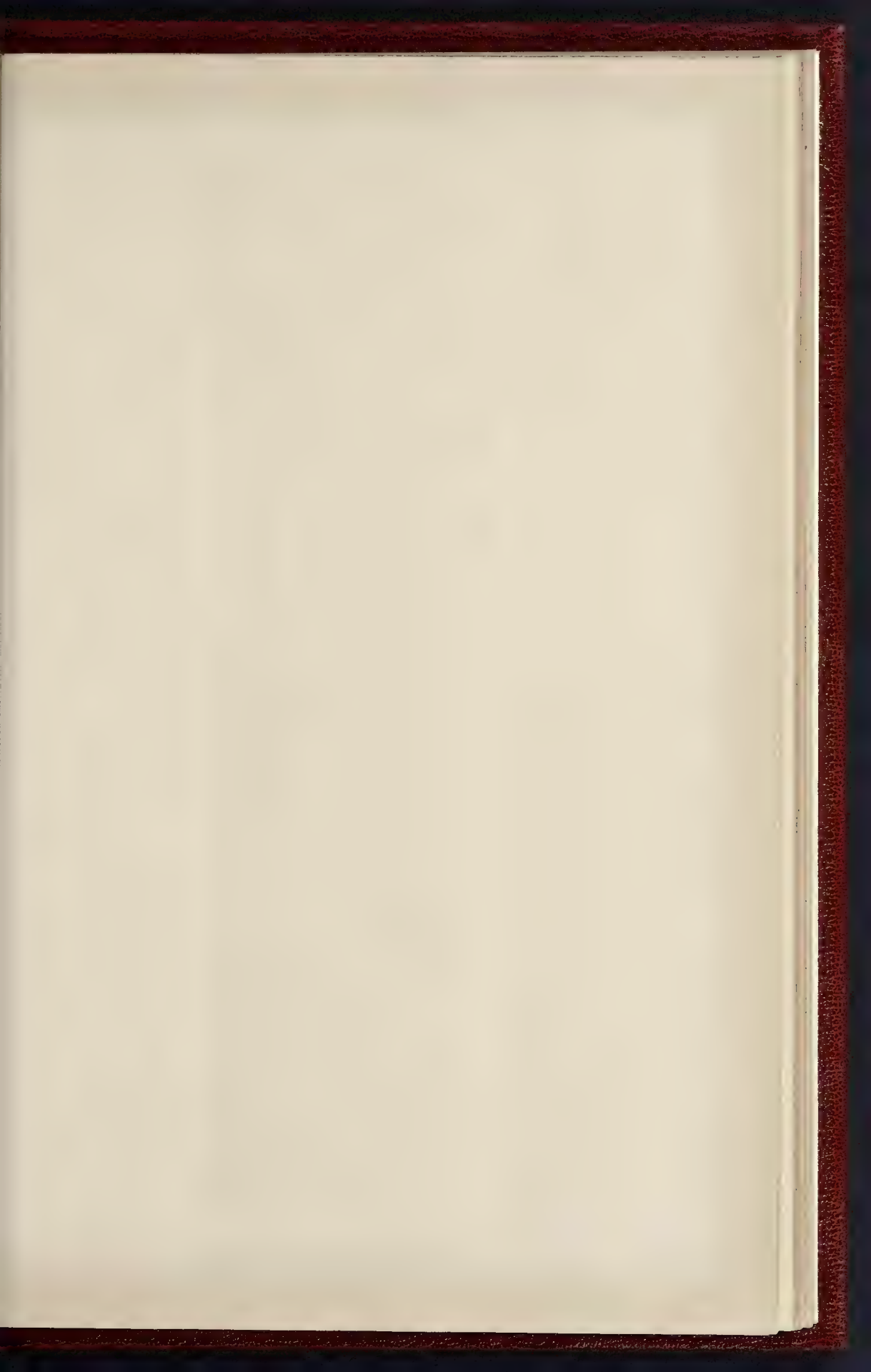






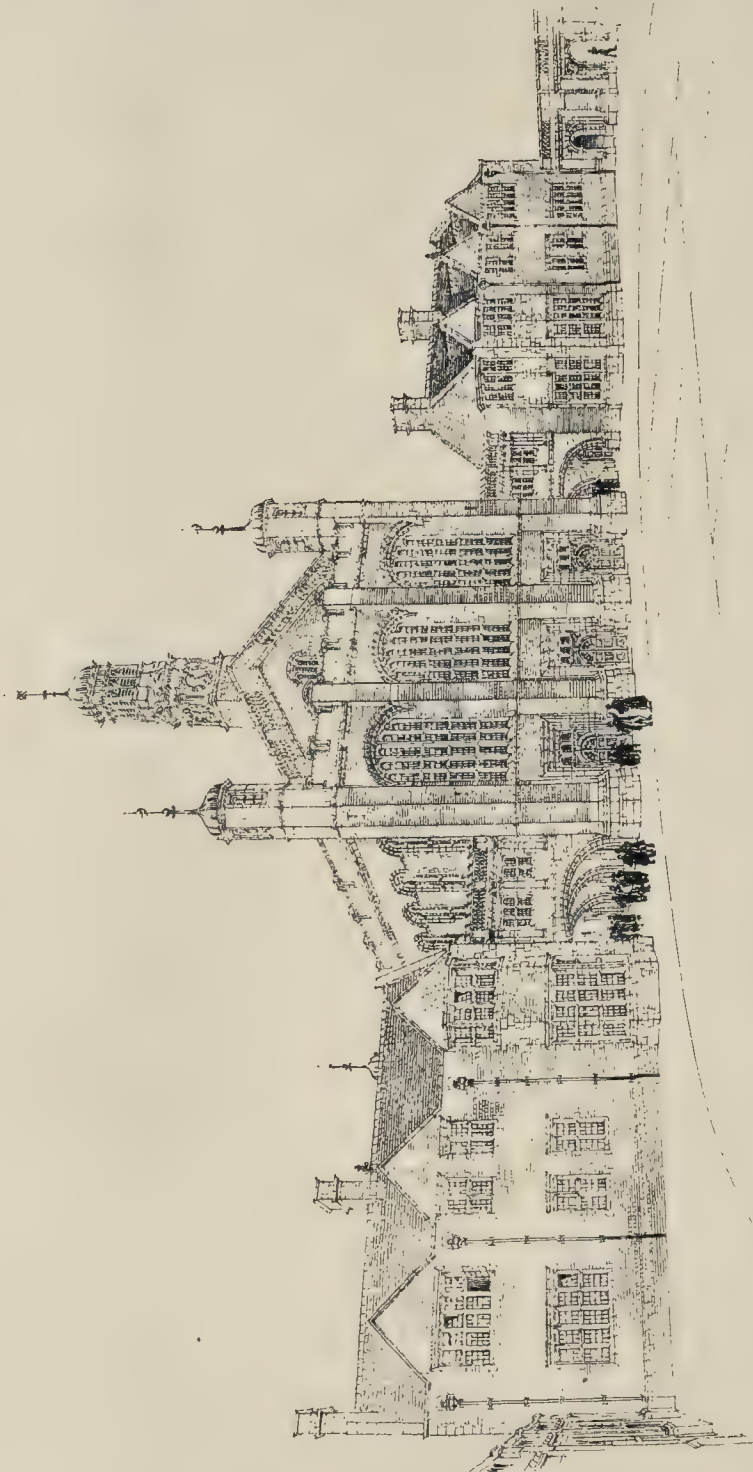
THE BUILDER, JUNE 16, 1894







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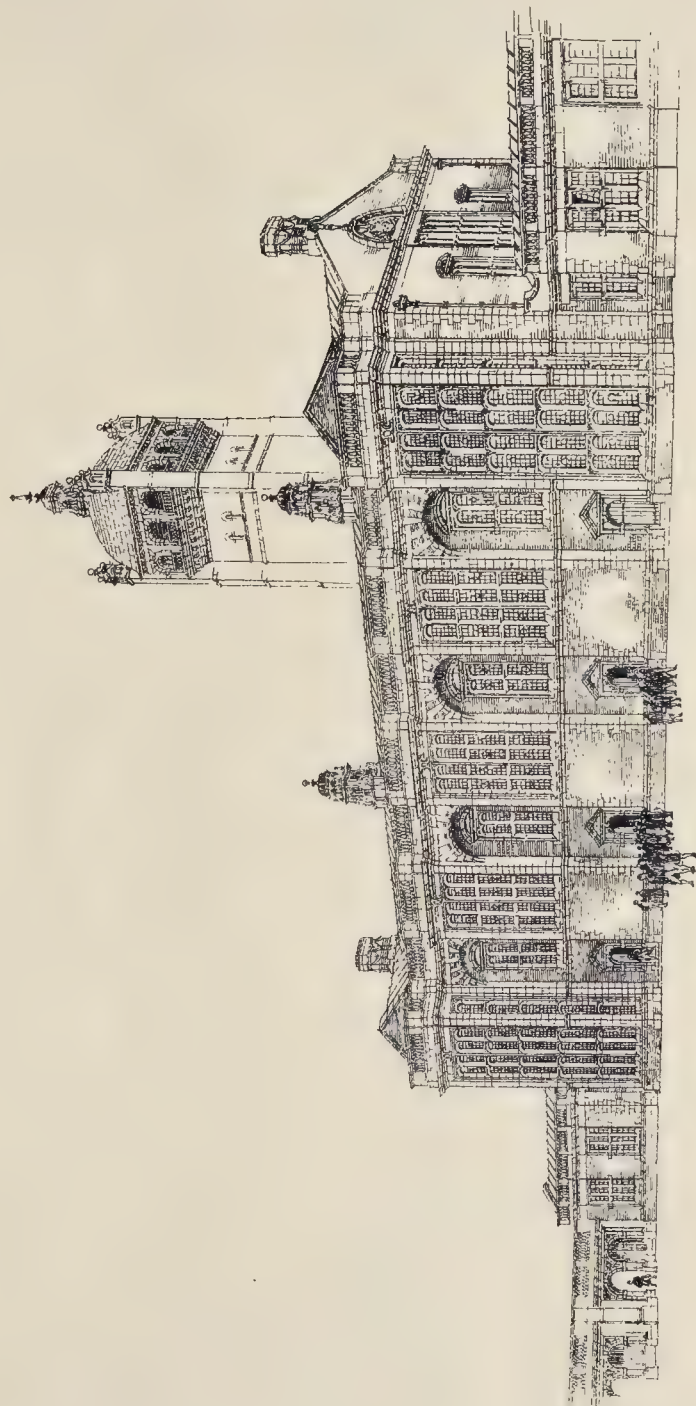


PHOTO-LITHO, SPRAGUE & CO. 455 EAST MADISON STREET, CHICAGO, ILL.

SELECTED DESIGN FOR CHRIST'S HOSPITAL SCHOOLS.—MESSRS. ASTON WEBB & E. INGRESS BELL, ARCHITECTS.  
THE DINING HALL.





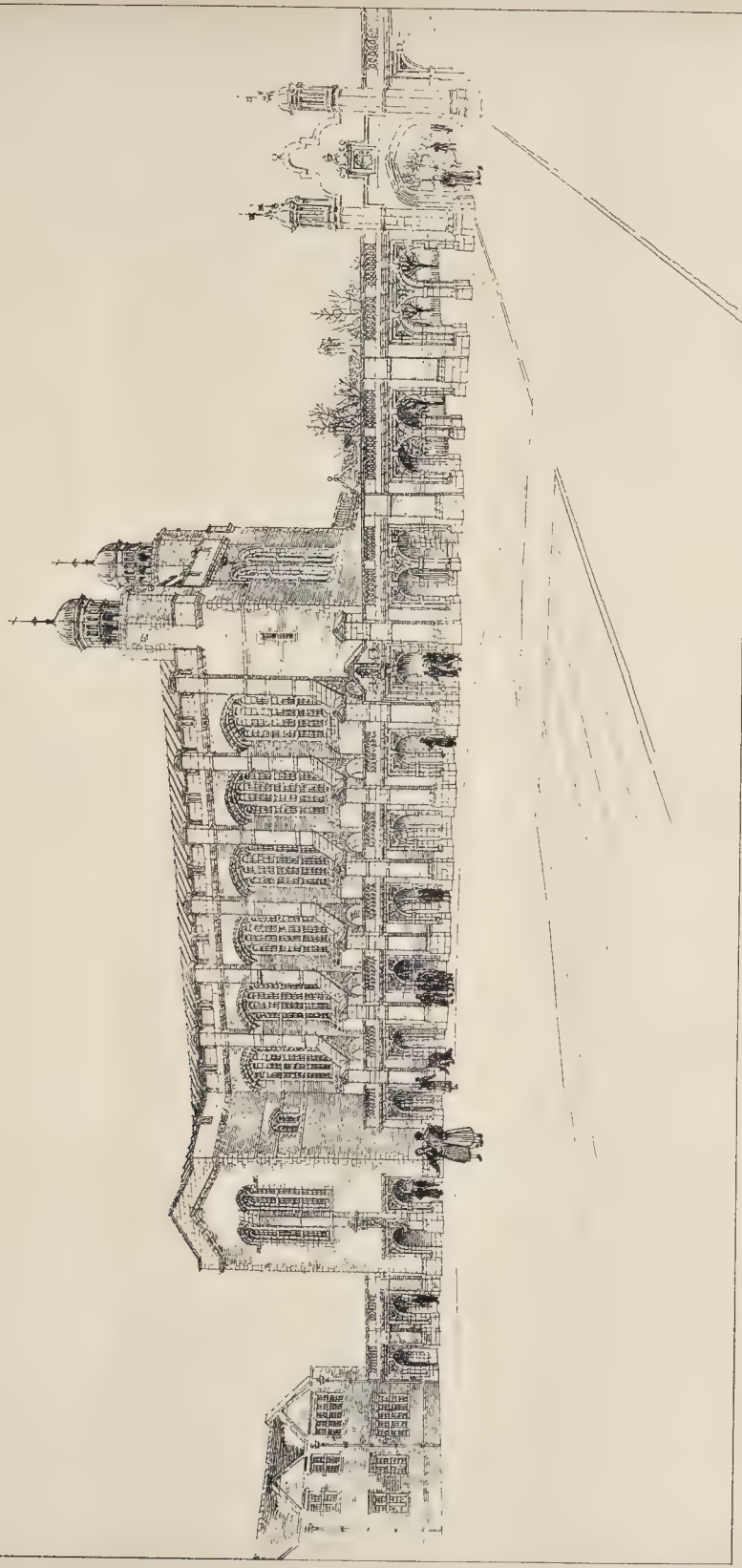


PHOTO LITHO SPENCER & CO. 48, 49, 50, 51, 52, 53, 54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71, 72, 73, 74, 75, 76, 77, 78, 79, 80, 81, 82, 83, 84, 85, 86, 87, 88, 89, 90, 91, 92, 93, 94, 95, 96, 97, 98, 99, 100, 101, 102, 103, 104, 105, 106, 107, 108, 109, 110, 111, 112, 113, 114, 115, 116, 117, 118, 119, 120, 121, 122, 123, 124, 125, 126, 127, 128, 129, 130, 131, 132, 133, 134, 135, 136, 137, 138, 139, 140, 141, 142, 143, 144, 145, 146, 147, 148, 149, 150, 151, 152, 153, 154, 155, 156, 157, 158, 159, 160, 161, 162, 163, 164, 165, 166, 167, 168, 169, 170, 171, 172, 173, 174, 175, 176, 177, 178, 179, 180, 181, 182, 183, 184, 185, 186, 187, 188, 189, 190, 191, 192, 193, 194, 195, 196, 197, 198, 199, 200, 201, 202, 203, 204, 205, 206, 207, 208, 209, 210, 211, 212, 213, 214, 215, 216, 217, 218, 219, 220, 221, 222, 223, 224, 225, 226, 227, 228, 229, 230, 231, 232, 233, 234, 235, 236, 237, 238, 239, 240, 241, 242, 243, 244, 245, 246, 247, 248, 249, 250, 251, 252, 253, 254, 255, 256, 257, 258, 259, 260, 261, 262, 263, 264, 265, 266, 267, 268, 269, 270, 271, 272, 273, 274, 275, 276, 277, 278, 279, 280, 281, 282, 283, 284, 285, 286, 287, 288, 289, 290, 291, 292, 293, 294, 295, 296, 297, 298, 299, 300, 301, 302, 303, 304, 305, 306, 307, 308, 309, 310, 311, 312, 313, 314, 315, 316, 317, 318, 319, 320, 321, 322, 323, 324, 325, 326, 327, 328, 329, 330, 331, 332, 333, 334, 335, 336, 337, 338, 339, 340, 341, 342, 343, 344, 345, 346, 347, 348, 349, 350, 351, 352, 353, 354, 355, 356, 357, 358, 359, 360, 361, 362, 363, 364, 365, 366, 367, 368, 369, 370, 371, 372, 373, 374, 375, 376, 377, 378, 379, 380, 381, 382, 383, 384, 385, 386, 387, 388, 389, 390, 391, 392, 393, 394, 395, 396, 397, 398, 399, 400, 401, 402, 403, 404, 405, 406, 407, 408, 409, 410, 411, 412, 413, 414, 415, 416, 417, 418, 419, 420, 421, 422, 423, 424, 425, 426, 427, 428, 429, 430, 431, 432, 433, 434, 435, 436, 437, 438, 439, 440, 441, 442, 443, 444, 445, 446, 447, 448, 449, 450, 451, 452, 453, 454, 455, 456, 457, 458, 459, 460, 461, 462, 463, 464, 465, 466, 467, 468, 469, 470, 471, 472, 473, 474, 475, 476, 477, 478, 479, 480, 481, 482, 483, 484, 485, 486, 487, 488, 489, 490, 491, 492, 493, 494, 495, 496, 497, 498, 499, 500, 501, 502, 503, 504, 505, 506, 507, 508, 509, 510, 511, 512, 513, 514, 515, 516, 517, 518, 519, 520, 521, 522, 523, 524, 525, 526, 527, 528, 529, 530, 531, 532, 533, 534, 535, 536, 537, 538, 539, 540, 541, 542, 543, 544, 545, 546, 547, 548, 549, 550, 551, 552, 553, 554, 555, 556, 557, 558, 559, 560, 561, 562, 563, 564, 565, 566, 567, 568, 569, 570, 571, 572, 573, 574, 575, 576, 577, 578, 579, 580, 581, 582, 583, 584, 585, 586, 587, 588, 589, 590, 591, 592, 593, 594, 595, 596, 597, 598, 599, 600, 601, 602, 603, 604, 605, 606, 607, 608, 609, 610, 611, 612, 613, 614, 615, 616, 617, 618, 619, 620, 621, 622, 623, 624, 625, 626, 627, 628, 629, 630, 631, 632, 633, 634, 635, 636, 637, 638, 639, 640, 641, 642, 643, 644, 645, 646, 647, 648, 649, 650, 651, 652, 653, 654, 655, 656, 657, 658, 659, 660, 661, 662, 663, 664, 665, 666, 667, 668, 669, 670, 671, 672, 673, 674, 675, 676, 677, 678, 679, 680, 681, 682, 683, 684, 685, 686, 687, 688, 689, 690, 691, 692, 693, 694, 695, 696, 697, 698, 699, 700, 701, 702, 703, 704, 705, 706, 707, 708, 709, 710, 711, 712, 713, 714, 715, 716, 717, 718, 719, 720, 721, 722, 723, 724, 725, 726, 727, 728, 729, 730, 731, 732, 733, 734, 735, 736, 737, 738, 739, 740, 741, 742, 743, 744, 745, 746, 747, 748, 749, 750, 751, 752, 753, 754, 755, 756, 757, 758, 759, 760, 761, 762, 763, 764, 765, 766, 767, 768, 769, 770, 771, 772, 773, 774, 775, 776, 777, 778, 779, 780, 781, 782, 783, 784, 785, 786, 787, 788, 789, 790, 791, 792, 793, 794, 795, 796, 797, 798, 799, 800, 801, 802, 803, 804, 805, 806, 807, 808, 809, 810, 811, 812, 813, 814, 815, 816, 817, 818, 819, 820, 821, 822, 823, 824, 825, 826, 827, 828, 829, 830, 831, 832, 833, 834, 835, 836, 837, 838, 839, 840, 841, 842, 843, 844, 845, 846, 847, 848, 849, 850, 851, 852, 853, 854, 855, 856, 857, 858, 859, 860, 861, 862, 863, 864, 865, 866, 867, 868, 869, 870, 871, 872, 873, 874, 875, 876, 877, 878, 879, 880, 881, 882, 883, 884, 885, 886, 887, 888, 889, 890, 891, 892, 893, 894, 895, 896, 897, 898, 899, 900, 901, 902, 903, 904, 905, 906, 907, 908, 909, 910, 911, 912, 913, 914, 915, 916, 917, 918, 919, 920, 921, 922, 923, 924, 925, 926, 927, 928, 929, 930, 931, 932, 933, 934, 935, 936, 937, 938, 939, 940, 941, 942, 943, 944, 945, 946, 947, 948, 949, 950, 951, 952, 953, 954, 955, 956, 957, 958, 959, 960, 961, 962, 963, 964, 965, 966, 967, 968, 969, 970, 971, 972, 973, 974, 975, 976, 977, 978, 979, 980, 981, 982, 983, 984, 985, 986, 987, 988, 989, 990, 991, 992, 993, 994, 995, 996, 997, 998, 999, 1000

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THE CHAPEL.





real animals; but then Fergusson, as Dr. Acland says (for we suppose he is responsible for the additions), had no sense of humour; moreover he probably hardly recognised the traditional Celtic element in these decorative creatures. The Master of the University had no humour either. O'Shea ran into Dr. Acland's house one day in great excitement; "The Master of the University," cried he, "found me on my scaffold just now. 'What are you at?' says he. 'Monkeys,' says I. 'Come down directly,' says he, 'you shall not destroy the property of the University!'" It is a pity Fergusson did not live to read this; only that he had "no sense of humour."

One other good thing there is in the new portion of the book, Mr. Ruskin's message in August last year, when he heard that his address on the Oxford Museum was to be republished: "Say to my friends in the Oxford Museum from me, May God bless the reverent and earnest study of Nature and of Man, to his glory, to the better teaching of the future, to the benefit of our country, and to the good of all mankind." There is perhaps a point in the wording of this message beyond what appears. Ruskin resigned his connexion with the Museum in 1881, as a protest against the appointment of Dr. Burdon-Sanderson, whom he regarded as a vivisectionist *enragé*. Whether the wording of this "message" was intended to re-affirm his feelings, or whether he had recognised that his extreme opinions about vivisection were hardly tenable, is not very apparent; but it is a beautiful message in either case, and one we can all sympathise with.

*A Treatise on the Law of Support for Land, Buildings, and Public Works.* By GEORGE BANKS, Barrister. London: Street & Maxwell, Limited. 1894.

A SHORT and concise work on the subject of the law of support might not unreasonably be regarded as a convenience to some professional persons. But we fear that this book will scarcely fill the required place. It is far too prolix for anyone who is not a lawyer, and even the latter will prefer to consult the leading cases on the subject, rather than to wander through Mr. Banks's cloudy disquisition. For in truth this treatise is spoilt by the mass of verbiage in which the legal propositions are involved by the author. This tendency to prolixity is shown at the very beginning of the book, in which an introductory chapter tells us what the author proposes to lay down in later portions of the work; "it will be seen," and so forth. But no one in a book which is only one hundred and fifty pages in length desires to have a preliminary insight into the subject, he wishes to know clearly and at once what the law is. In the body of the work the same fault is apparent—thus on noticing the doctrine that the owners of contiguous buildings which have no right of support from one another are nevertheless bound to exercise care and skill in the execution of any structural alteration, so as not to injure the neighbouring property, Mr. Banks proceeds: "It has been thought by some that the existence of any such duty has been negatived by the *ratio decidendi* in *Lemaitre v. Davis*, apparently on the following grounds." Having then stated the "apparent" grounds of opposition to the scheme the author proceeds to demolish them. It is obvious, however, that if all the argumentative reasons against a particular proposition are to be stated and combated in a legal treatise, it may be enlarged to an endless extent. Mr. Banks has a full and an accurate knowledge of his subject, but like many persons in a similar state, he has not reflected sufficiently over the manner of imparting it to his readers. Nine-tenths of the legal works of the day on subjects of this class are spoilt by the want of form and system.

*Betterment, Worsement, and Recoupment.* By A. A. BAUMANN, Barrister. London: Edward Stanford. 1894.

MR. BAUMANN has given some attention to the question with which he deals in his pamphlet. Though he says in his preface that he wishes to treat the subject temperately, he approaches it as a partisan and an opponent of betterment; but it is essentially one which should be treated judicially. The interest, however, of this little work has been taken away by the appointment of the House of Lords Committee, though anyone who still wishes to see the recent proposals of the County Council sharply criticised will be satisfied by perusing this book.

*The Tower Bridge: its History and Construction from the date of the Earliest Project to the present Time.* By J. E. TUIT, M.Inst.C.E. London: office of the Engineer; 1894.

THIS book is a collection of papers by Mr. Tuit, engineer to Sir William Arrol & Co., the contractors for the Forth Bridge and the Tower Bridge, put into a book form as an opportune publication at the present moment. The book is largely illustrated, both with pictorial representations of the bridge and with constructive diagrams, and the author's information may be relied upon as accurate. It is not a "popular" book on the bridge, of course; there is too much real information in it for that; but there is a certain amount of history and illustration in it which may be "comprehended of the people," and the book will serve as a good memorandum of a remarkable work.

*Curtice's Index to the "Times," the London Morning and Evening Papers, One Hundred and Twenty Weeklys, and Thirty-One Provincial Newspapers.* E. CURTICE. London: Romeike & Curtice. 1894.

THIS is the first number of an attempt to publish a quarterly index to the contents of the principal English daily and weekly papers, at an interval of a few months after date. The opening number deals with the period from July 1 to September 30 of last year. An elaborate but easily-comprehended system of abbreviations is used, in order to get the information into a reasonable compass. But we fear the projectors are attempting the impossible. Unless such an index is complete it is of very little use, as it will probably miss out the very thing one wants. In regard to the contents of our own issues for that period the index is exceedingly incomplete, and capricious, as there seems no leading principle as to what should be included and what omitted. Why, for instance, is "Sculpture at the Chicago Exhibition" included and all the other articles on the Chicago Exhibition during the same quarter omitted? Why is one of our illustrations of Scottish cathedrals during that quarter indexed, and the two others omitted? And we might continue such questions a great deal further. We do not believe the scheme can have any success; it is beyond possibility. It is no use unless it were much more complete and systematic than this; and then it would become too large to carry out at all.

*Walks in Belgium.* Edited by PERCY LINDLEY. London: 30, Fleet-street.

THIS small guide-book is apparently published in the interests of the Great Eastern Railway, as none but the Harwich route is mentioned; but it is a useful little guide giving a good deal of information about places to visit; and for so cheap a handbook it is very respectably illustrated.

#### TRADE CATALOGUES.

THE Farringdon Works (London) send us an illustrated catalogue of their horticultural plant, including pumps, garden hose, garden seats, portable fountains, and delivery hose, &c.—Mr. L. Casella, the well-known scientific instrument-maker, sends us his new list of standard meteorological and other instruments, with a number of diagrams. The "notes" to this publication contain a great deal of useful information, and raise it quite above the level of a mere catalogue in the ordinary sense of the word.—Sir W. A. Rose & Co.'s "Perfect Diamond Enamel" for decorations is illustrated in a card of the colours obtainable in it. The enamel is stated to be specially suitable for baths, as it is not affected by boiling water.—From Messrs. Jones & Campbell we have received a catalogue of their patent ranges, grates, stoves, &c. Some of the ranges present special advantages, among others the "Roseberg" range for small dwellings, which has been adopted by the Corporation of Glasgow in their improved dwellings.—Messrs. Winsor & Co. send us their new and very completely illustrated catalogue of sanitary ware and drainage appliances, accompanied by plans of houses showing their complete system of drainage, and illustrations of various special forms of sanitary appliances made by them, among which may be mentioned the "Villa Detector," or intercepting and flushing trap with inspection shaft, for use for small properties where it is desired to avoid the expense of a built inspection chamber. The catalogue is a highly creditable one in every respect.

## Correspondence.

To the Editor of THE BUILDER.

### SEWER AND DRAIN VENTILATION.

SIR,—The letter from Mr. Read, on page 447, shows a lamentable want of knowledge of the important subject. He opposes the law as laid down by the Local Government Board, the opinion of the great majority of the members of the medical profession, as well as the general practice of the day, all on very shallow reasoning.

Mr. Read would have us believe that "sewer gas," or offensive or dangerous sewer air, would become a thing of the past if all "intercepting" traps were done away with, so that the obstruction which he says they cause to the passage of the sewage from the house to the sewer was done away with. Now it so happens that even a vertical waste-pipe discharging above ground—and which has nothing to prevent the quick passage out of its waste water—often smells offensively, consequently Mr. Read's motion or assertion that ordinary house drains and sewers could be used for the passage of waste water and water-closet soil from houses, not to speak of warehouses and hospitals, without having offensive smells in them is purely imaginary.

The public sewers also receive matters from manufactories, chemical works, &c., which often cause very offensive smells *per se*, but the cause of the intercepting trap to shut out these from the house, quite independent of its use in keeping out rats and ordinary sewage air from our house pipes. Mr. Read strives to prejudice your readers by stating that Mr. Buchan writes as he does in defence of his so-called "interceptor." Now, I advocated the propriety of disconnecting the pipes from the sewer long before I either invented or used any particular "interceptor" of my own. My experience as a practical plumber working daily among houses led me to see that it was dangerous, in more ways than one, to have a free aerial highway between the sanitary appliances in the houses and the public sewer. Previous to 1875, however, the disconnecting appliances between the house and the sewer were open to Mr. Read's objection of retarding the flow of the sewage from the house to the sewer; when, however, an "interceptor" or trap was invented whose water surface, on its house side, was two inches or more below the bottom of the drain pipe, so that, when it, then Mr. Read's objection was made, and, further, when the surface of the water on the house side of this "interceptor" was small, and the body of water in said "interceptor" little, then in practice Mr. Read's objections were purely fanciful. The water in an intercepting trap having a drop of 2 in. or more in it allows the water to run out at its outlet end as quickly as it comes in at its inlet end, without causing the water to lie back in the drain, for the water from the drain falls into the trap.

Further, Dr. Carmichael's experiments proved that water lying in an improved intercepting trap, even although somewhat contaminated with sewage, as in ordinary use, was not dangerous. What is dangerous is the air in the drain and sewer coming along with it dangerous particles which it dislodges by its motion and drying power from the sides of the sewer or drain-pipe. The decomposition of feces in a proper disconnecting trap exists only in Mr. Read's imagination, as in ordinary practice these do not lie sufficiently long in it, when they lie at all, as the water in the trap is so often renewed from other appliances than the water-closet.

On page 445 I perceive Mr. Read stating that he was apparently in a minority in regard to his views as to sewer ventilation; this will make him all the prouder of securing Mr. West as a convert. When, however, Mr. Read admits, as published on page 445, that the use of a ventilating pipe from the sewer side of the trap is serviceable for the ventilation of the sewer, he virtually comes round to my views, as these pipes at Torquay, approved of by Mr. Garrett, C.E., have been recommended by me for about twenty years back. The municipal and county engineers at their meeting at Torquay, as reported on pp. 444-45, appear to have been unanimous in their approval of the use of an intercepting trap, while approving also of the plan of ventilating the public sewer by a special pipe put up from the sewer side of the trap.

With so many thousands of breakable earthenware water-closets in use—many with little water-lock—the traps of which sometimes freeze and burst in winter (not to sp. of other dangers), the benefit to the occupants of putting their houses in direct aerial communication with the public sewer and risking the flooding of their atmosphere with sewer air is difficult of appreciation. The enunciation by Mr. Read of such views as those published on page 447 may bring him notoriety, but I do not think they do him credit, while they are not to the benefit of the community at large.

W. P. BUCHAN.

Glasgow, June 9, 1894.

SIR,—The recent paper by Mr. West and the letter from Mr. Read in last week's *Builder* are very interest-



ing to those who desire to see improvement in the ventilation of sewers and drains. No one can doubt that if sewers and drains are in perfect condition for carrying off at once all that is discharged into them, uninterrupted channels for ventilation are the best means of preventing the air from becoming vitiated, nor will any one deny that an "interceptor" is an obstruction to the free circulation of air and that it always retains a certain quantity of foul matter and water.

In 1891 at the Sanitary Institute I read a paper entitled "The Sewerage of the town of Maldon, Essex, with some observations on recent practice in sewer ventilation" which contained the following passage:—"The beneficial effect observed from the increasing practice of erecting upcast shafts up the sides of houses and elsewhere to ventilate the main sewers coupled with the absence of any danger or prejudice to the public health if carried sufficiently high, suggests the consideration whether the main sewers might not be advantageously ventilated through the house drains omitting the syphon traps now usually fixed in those drains outside the house."

The conclusions at which Mr. Read and Mr. West have arrived appear to entirely support this view, and they have thus carried the inquiry into the improvement of sewer ventilation a step further. Mr. Walker, of Croydon, has shown by his observations on the effect of gas destructors in ventilating pipes to sewers that they retard the current of air as compared with an open and unobstructed shaft, and, as Mr. Read points out, the experiments of the Sanitary Institute show that "interceptors" retain a considerable proportion of foul matter.

It seems to me, however, that before the use of "interceptors" could be abandoned, the ventilators from every, or at any rate a large proportion of houses in a street should be connected with the main sewer on similar lines to the system adopted some years ago in the City of Memphis, U.S., where a 4-in. ventilator, unobstructed by any trap, was made compulsory to every house.

This will be difficult, and, indeed, inadmissible, in old streets where the buildings and sewers are old and the latter, perhaps, not well laid; but in the sewerage of towns *de novo*, or in the laying out of new streets and sewers, over which the local authorities now exercise such close supervision, there should be no such difficulty in adopting the system with new buildings.

I do not agree with Mr. West in thinking that all road surface-openings should be closed, for, in that case, there would not be a sufficient number of air-inlets.

But I cannot believe that where sewers and house drains are thoroughly well laid and where the ventilator of every house drain is also a ventilator of the main sewer the abolition of "interceptors" need be attended with any danger to health.

At all events, after much observation and consideration, it seems to me that Mr. Read and Mr. West are working in the right direction towards the improvement of sewer ventilation.

RICHARD F. GRANTHAM, M.Inst.C.E.

SIR.—Mr. Read, in his letter in your issue of the 9th inst., takes exception to the fact that most interceptors have cleaning arms, which he takes as conclusive proof that interceptors are very liable to get blocked. As a rule, interceptors very rarely do get blocked, and when they do it is usually a case where the drains are not properly looked after; but, as a matter of fact, the cleaning arm is not provided for the purpose of cleaning the trap, but simply as a means of access to the drain laid between the interceptor and the sewer, thereby, in case of need, saving considerable expense in opening up the ground.

SANITAS.

#### NO. 1,615, R.A. EXHIBITION.

SIR.—In your issue of June 9 you describe my design "Borrowstone Lodge, Deeside," as "in fact alterations to an old house. As far as the plan is concerned these are small but important, including a circular room effectively placed." In point of fact, the entire elevations on all sides are new, and the only parts of the older house embodied in the design are the internal walls of the hall, dining-room, and the circular room, and certain cellars at the back. The materials intended were stone covered with rough-cast with grey granite quoins, strings, and dressings. I should be much obliged if you would insert this correction.

REGINALD BLOMFIELD.

\* \* We took the dark portions of the plan to be the new work, whereas it appears they are the old.—ED.

ANCIENT OAK DOORS, STRATFORD-ON-AVON.—We understand that the missing doors of Shakespeare's church at Stratford-on-Avon have been recovered. The builder to whom they were sold returned them to the custody of the churchwardens; and they are once more in safe custody.

\* As we have already pointed out, they also showed that the straight drain retained a great deal of matter, with a two-gallon flush. The Sanitary Institute experiments were not carried out with any view of obtaining evidence as to the action of the interceptor.—

## The Student's Column.

### THE STRUCTURE AND PHYSICAL PROPERTIES OF BUILDING STONES.—XXIV.

#### MAGNESIAN LIMESTONES.

THE formation yielding the whole of the building stones classed under the term Magnesian Limestones is a member of the Permian series, and holds a persistent place or zone down the north-east of England from South Shields to Nottingham, and attains to a thickness of about 600 ft. The same formation is also represented on the western side of the Pennine chain, only in a much more attenuated form, and is not noted there as producing much building material.

On a former occasion\* we described the principal quarries of magnesian limestone, together with a full account of their chemical composition; whilst certain physical properties were dealt with in our last article. It now remains for us to describe the minute structure of the principal varieties of the stone, and to explain the connexion between this and the physical properties adverted to.

Probably the best-known stones from this horizon are those raised in the vicinity of Mansfield, in Nottinghamshire, which will therefore serve as types in the following description. They are of several kinds, varying from a true magnesian limestone to a sandstone, chiefly made of quartzose grains, and bound together by the carbonates of magnesia and lime. The micro-section illustrated in fig. 35 shows a common form of the rock. This is seen to be made up of

FIG. 35.

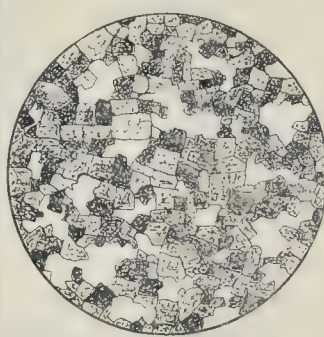


FIG. 35.—Micro-structure of Yellow Magnesian Limestone, from Mansfield.

crystals of dolomite (rhombic) adhering to each other, and having no matrix of any kind. These crystals are roughly rectangular in shape, though many are irregular; they do not all of them appear to be preserved in the same degree, for, as seen under the microscope, some are destroyed to such an extent as to be almost opaque, whilst others are comparatively clear and transparent, with indications of cleavage lines. A few quartz grains are present, and account for the small percentage of silica found even in true magnesian limestones. The more or less rectangular crystals, and the peculiar free spaces so abundantly found in the material, are so characteristic that the student is not likely to confound this with any other building stone. We may remark, however, that the size and frequency of the free spaces vary with the position of the rock in the quarry, and that some magnesian limestones are so compact that the crystals have not had an opportunity to assume their regular form. It must be remembered that, like all the micro-sections recently figured in our columns, the rock is enlarged about sixty times, and that the spaces are in reality very minute—so small in fact as to be barely discernible with a good hand lens. We must distinctly point out also that the presence or absence of such spaces in a rock of the kind now described is not in any way indicative of durability. A magnesian limestone from one quarry may be entirely devoid of spaces, and yet may not be as durable as one in which they are frequent. The student will understand the application of this principle, which is the outcome of our personal studies on this question, on turning to our

observations on the micro-structure of the different varieties of Portland stone (*ante* p. 294). There he will perceive that the durability of the material is almost entirely dependent on the state of crystallisation of the calcic granules, and the firmness of their adhesion to one another, that these granules have for the most part no matrix, and that free spaces exist throughout. If now we substitute crystals of dolomite for the calcic granules we introduce similar conditions. Therefore, the weathering and relative durability of magnesian limestone is entirely governed by the state of crystallisation of these minute dolomite crystals and the strength of their cohesion to each other—the free spaces may be ignored.

Another interesting point in connexion with the rock represented in fig. 35, as showing the complete independence between its free spaces and its rate of weathering, is the comparatively small ratio of absorption. The micro-section alluded to was cut from the same stone as the block experimented with in our absorption tests detailed in the last article, and described as "Yellow Magnesian Limestone." It will be observed that the stone only absorbed 3.48 per cent. of its bulk of water, in spite of its open character, after being immersed one week. This is no doubt owing to the impenetrability of the dolomite crystals, which completely surround and enclose the free spaces so that no water can find its way to them.

We have now under the microscope another section of magnesian limestone from near Mansfield, but from a different quarry to that from which the last-mentioned sample was obtained. It illustrates an extreme type of the stone, being composed of much smaller crystals, which are not so regular as those shown in fig. 35, whilst the spaces are relatively smaller and infrequent. Quartz grains are conspicuous by their absence, but there is a little chalcadonic infiltration.

The student's attention may now be directed to fig. 36, which represents the minute structure of

FIG. 36.

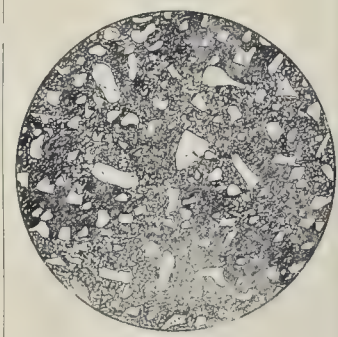


FIG. 36.—Micro-structure of "Red Mansfield" Sandstone.

what is called Red Sandstone, from the Mansfield district. Here the rock is seen to be made up of angular and sub-angular grains of quartz (denoted by the lighter portions of the illustration), and exceedingly minute dolomite crystals, bound together partly by the cohesion of the crystals, but chiefly by a form of iron (dark patches and streaks in the illustration), which thus constitutes a species of matrix. The ferruginous mineral matter is quite opaque. On examining the slide in reflected light we notice that the dolomitic constituent has absorbed a certain amount of iron, and that, together with the darker ferruginous matrix, they form a somewhat indistinct background, and account for the coloration of the material.

The weathering of this rock would be governed by the relative solubility of the iron, and the adhesion of the dolomitic portions—the quartz lends no support whatever. As to whether the stone would keep its colour on exposure to the atmosphere, that depends very largely on the degree of porosity of the dolomite crystals, and when we find that the material only absorbs 4.29 per cent. of its bulk of water in one week (see last article) we may conclude that its rich tones are fairly permanent. We are speaking, of course, of this particular stone only.

There is every gradation in structure between the stone illustrated in fig. 35 and that in fig. 36—depending on the quarry and the horizon in it. One notes the gradual incoming of quartz grains in the yellow magnesian limestone (fig. 35) until

\* The Builder, November 30, 1886, pp. 754-5.



They are abundant enough to make the variety known in the market as "White Mansfield" sandstone. Then the dolomite gradually assumes a secondary position, and quartz grains form more than one-half of the material, though they never (at least in any of the micro-slides we have examined) preponderate to such an extent as to render the material a sandstone in the strict sense of the term. The Mansfield red sandstone, in fact, occupies relatively the same position to true magnesian limestone, as the "Green Finney" Chilmark stone (*ante* p. 312) does to true oolite—the one is a calcareo-magnesian sandstone, whilst the other is a siliceous limestone.

Architects will have noticed that certain varieties of "Yellow Mansfield" possess a number of black specks; these appear to be due to the filling up of the minute free spaces with some black mineral, most probably a form of iron. Other kinds of the stone are permeated with string-like veins of light tint, of secondary origin. Altogether, the structure of the Mansfield building stones, and the magnesian limestones and sandstones generally, is exceedingly interesting and worthy of more extended investigation than we are able to give it at present.

## KENTISH RAG.

We have studied a number of micro-slides from different quarries yielding this well-known building stone; but the characters are so divergent, even in the same bed of the quarry, that no good purpose could be served by describing each in detail. This appears to be one of the few stones in the country that are exceedingly difficult to satisfactorily localise from mere micro-examination—that is to say, although the micro-characters of Kentish Rag are constant from the generic point of view (so that one can be quite certain he is dealing with that particular kind of building stone and no other) the stones from the various workings do not appear to possess specific distinctive features. All we now intend to do, therefore, is to describe a typical specimen of the stone, and the one selected for the purpose comes from a quarry at Ightham. This is illustrated in fig. 37. It is

FIG. 37.

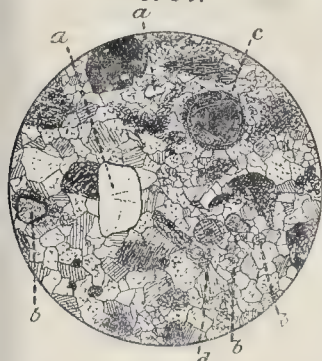


FIG. 37.—Micro-Structure of Kentish Rag, from Ightham.

a=Quartz grains, b=Glauconite, c=Oolitic granule, d=Ossicle of Crinoid.

difficult to know what to call this rock; it contains, as we see, fragments of quartz, parts of crinoids and other organic remains, with small green particles which we take to be the mineral glauconite, and an occasional oolitic granule. That this building-stone is slightly oolitic has been noticed by previous observers—first, we believe, by Mr. Sorby in his address to the Geological Society in 1879; but though the rock is no doubt largely derivative, we cannot think that the whole of the oolitic granules have been derived from pre-existing formations, as has been stated by some geologists. Most of them are different in character to ordinary Jurassic granules, and are certainly indigenous to the stone. The whole of these fragments and foreign particles are bound together by granular calcite, almost as highly crystalline as in some of the Carboniferous limestones, and much secondary alteration has taken place.

Judging from our experiments (see last article), the Kentish Rag of Ightham is not very porous, as might have been anticipated from its micro-structure. It absorbed only 1·30 per cent. of its bulk of water in one week, which is less than any

freestone dealt with. Its specific gravity is correspondingly high (2·56), the weight of a cubic foot when saturated being about 165 lbs. At the same time, we would not have the student believe that all Kentish Rag has such properties—this is merely an example of the greenish-blue variety, used mostly for rough stone work, and occasionally as road-metal—but is a fair specimen.

## GODSTONE FIRESTONE.

The Upper Greensand in the vicinity of Godstone yields a peculiar stone quarried at several points at the base of the Chalk escarpment in underground mines. For the benefit of students living in London, to whom these quarries are very accessible, we may give the material a short description, though it is not now such an important building stone as it was years ago. Let us take the student, in imagination, to the Godstone Hill quarry, half-way between Godstone and Caterham, the precise position of which is delineated on the geological map given in our columns\* some months since. Arrived at the quarry we observe a tunnel with tram-lines running into it; under guidance we follow these lines underground for a long distance, and coming to a heading where a number of men are at work, observe the following section—

## Section at Godstone Hill Quarries.

	ft. in.
Rag, used for hearthstone .....	2 0
Bedstone, for scouring .....	0 8
Hearthstone and firestone (two beds), called grit .....	1 0
Firestone for backing furnaces, glass work, &c. ....	1 5
Firestone, used principally for glass work .....	1 0

The thicker beds, though now more valuable by means of their heat-resisting properties, were formerly used in London and elsewhere for building—even in important edifices. The stone is worked by picking out the 3 in. or 4 in. below the ceiling; there are no cranes. A peculiar tool, called a "maddock," is used for picking purposes.

The rock is highly siliceous, but a micro-examination shows that this is as much due to the abundance of spicules of sponges as to minute quartzose matter. Its green tint may be due to glauconite. Judging from appearances underground, the material does not seem to be capable of withstanding a very heavy weight.

## OBITUARY.

MR. ARTHUR CAWSTON.—We regret to record the sad death of Mr. Arthur Cawston, architect, of Westminster, and the Grange, Wimbledon. On the 8th inst. Mr. Cawston requested his clerk to bring him some oil. Immediately the boy left the room a report was heard, and Mr. Cawston was found shot through the face, death being instantaneous. He had an old-fashioned French pistol in his hand, and apparently was unaware that it was loaded. The deceased, who was 37 years of age, was the author of "A Comprehensive Scheme for London Street Improvements." He was the architect of the new buildings of the British Hospital for Incurables to be opened by the Princess of Wales next month; mansion and large farm buildings at Paddockhurst, Sussex; mansion at Marden Park, Surrey; various houses at Bromley, Kent; Church of the Ascension and vicarage, Baltham Hill, S.W.; public market buildings at Carlisle, in conjunction with Mr. Joseph Graham, of that city. He was also the architect of St. Philip's Church, Stepney, which we illustrated in the *Builder* for October 11, 1890. Amongst other illustrations of Mr. Cawston's work which have appeared in our pages we may mention St. Luke's Church, Bromley Common, which we illustrated on January 17, 1891.

MR. E. LUNCOME.—On the 6th inst. the remains of the late Mr. E. L. Luncome, builder, of Exeter, Surveyor to the Dean and Chapter for the Cathedral, and Surveyor for the Bishop under the Ecclesiastical Dilapidation Act, were buried in the Higher Cemetery, Exeter.

## GENERAL BUILDING NEWS.

SCHOOLS, WIGAN.—The foundation stone has just been laid by the Bishop of Liverpool (Dr. Kyle) and Sir Francis Sharp Powell, Bart., M.P., of the new church schools to be erected in the parish of St. Andrew's, Wigan. The schools consist of a large mixed school, classrooms, and cloak-rooms, &c., also an infant school adjoining. The work has been let to Mr. C. B. Holmes, of Wigan, and will cost when completed, 2,700*l*. The architects are Messrs. Heaton & Ralph, Wigan.

NEW CHURCH AT HEPPLE.—Christ Church, Hepple, together with a new burial-ground, was consecrated on the 5th inst. by the Bishop of Newcastle. The church is a small one, having accommodation for about 100 people. It is built of local stone, from designs by Mr. C. Hodgson Fowler, of Durham, and consists of nave and chancel.

CONGREGATIONAL CHURCH AT RUSHDEN, NORTHAMPTONSHIRE.—On the 7th inst. a new Congregational church was opened at Rushden. The new building is of Gothic design, built of red bricks, with white stone dressings, and is approached by a porch, over which is a three-light window. Accommodation is provided in the body of the chapel for 300 persons, and a gallery at the Church-street end provides sitting room for 100 more. The open pews are of pitch-pine, and a dado of varnished deal runs all round the walls. The rostrum front is also of pitch-pine, with turned pillars, carved at the head and feet, and in front of this is a raised platform for the choir. The heating apparatus is supplied by Mr. A. Marriott, of Higham Ferrers. The cost of the building is between 1,600*l* and 1,700*l*. Mr. Edward Sharman, of Wellingborough, was the architect, and the contractors were Messrs. Brown & Sons, also of Wellingborough.

ENLARGEMENT OF ST. THOMAS'S HOSPITAL SCHOOL.—On the 6th inst. the Duke of Cornwall opened two new blocks in enlargement of the Medical School of St. Thomas's Hospital. By the two new blocks the school buildings will be doubled in width. The extension contains laboratories and class-rooms for pathology, biology, and practical surgery, as well as a large day-club room for students. Mr. Henry Curry was the architect. NEW CHAPEL AT BERKHAMSTEAD SCHOOL, GREAT BERKHAMSTEAD.—On the 7th inst. the Countess Browlaw laid the foundation stone of the new school-chapel of the Berkhamstead School, to be erected at a cost of about 3,000*l*. The chapel is designed by Mr. C. Rew, and adjoining it in the school grounds there will be erected chemical and physical laboratories, and a new lecture room in connexion with the science work of the school.

PROPOSED PERMANENT SANATORIUM FOR BRIGHTON.—On the initiative of the Sanitary Committee, a proposal was made to the Brighton Town Council on the 7th inst. to replace the existing temporary Sanatorium with the first section of a permanent Sanatorium, at a cost of 15,000*l*. The plans prepared by the Borough Engineer and Surveyor are based upon information obtained by the Mayor, Alderman Blaker, Dr. Newsholme, and himself in visits to other towns and in an interview with the Medical Officers and the Architect of the Local Government Board, and they are the outcome of the joint work of Mr. May and Dr. Newsholme. This hospital when completed will contain a total accommodation of 116 beds. The cost of the complete hospital may be put approximately at 26,124*l*, of which sum the blocks proposed to be built first will cost about 14,695*l*. These blocks include (a) the administration building, containing all the necessary offices and accommodation for the staff; (b) the general pavilion, comprising two wards, having two beds in each, on either side of the nurses' duty room, and an off room to each ward containing one bed for special cases; (c) the isolation pavilion, comprising three distinct blocks entirely disconnected from each other, each under the care of a separate nurse, the central block containing one ward having four beds, and one ward having two beds, and each end block having two wards with two beds in each; (d) porter's lodge and discharge room, at the entrance gates. Mr. May, the Borough Engineer, recommended that power be taken to borrow the whole sum required (say 27,000*l*) for a complete hospital for 116 beds, and all other necessary accommodation; and that the loan be taken up by instalments to build each section of the buildings as they may be required, and he further suggested that the first section as here enumerated should be commenced forthwith. The cost would not exceed 15,000*l*. The committee approved this recommendation and the plans, and recommended that just over 10 acres more land should be purchased from Alderman Blaker for 5,200*l*. It was agreed to postpone the question for three months.

RESTORATION OF WETTON CHURCH, STAFFORDSHIRE.—Wetton Church, Staffordshire, has just been restored and re-opened. The body of the church was so dilapidated that it was found necessary to lower its walls considerably, and build a heavily timbered open roof. The old floors were decayed, and have been replaced by new. New benching has been fixed throughout, the old pewing and gallery front being adapted as wainscot to the walls. A gallery has been removed from the west end, so disclosing the original tower arch. A new heating apparatus has been put in, and other incidental works carried out. Messrs. W. Sugden & Son, of Leek, have acted as architects, and the works have been carried out under their personal direction by Mr. J. W. Bassett, builder, of Hulme End. The altar frontal has been further worked by the Leek Embroidery Society to the architect's design.

RESTORATION OF STURMPSHAW CHURCH, NORFOLK.—Sturmshaw Parish Church, which for the past eleven months has been undergoing restoration, was reopened on the 31st ult. The work

\* The *Builder*, Oct. 28, 1893, p. 322.



undertaken comprises the re-seating of the nave with free and open pitch-pine benches; four new windows glazed with tinted glass, walls re-plastered, and wood block floor provided by Lowe, of Farnworth; besides some repairs to the tower, including louvres and new oak belfry floor. The light open-work pulpit of carved oak is the work of Howard, of Norwich, from designs by Mr. A. S. Hewitt, and harmonises with the ancient painted screen. The choir-stalls are of oak, the oaken portions of the benches placed there by the late rector being preserved and combined with new work. The floor of the sacristy is of Venetian marble mosaic, and the ancient piscina and sedilia have been restored to their original uses. The whole work has been carried out according to the plans, and under the direction of the architect, Mr. A. S. Hewitt, of Yarmouth, the contractor being Mr. R. W. Riches, builder, Postwick.

**PROPOSED NEW THEATRE FOR WALSLEY.**—At the Tynemouth County Petty Sessions, on the 11th inst., plans were submitted of a new permanent building for the approval of the magistrates. The plans, which had been prepared by Mr. W. Hope, of North Shields, showed a building capable of holding from 1,500 to 1,700 persons, and the cost, including the price of land, would be about 8,000. Mr. Hope explained the plans, and said he had been guided as far as possible by the rules of the London County Council. The building consisted of three stories, pit, dress-circle, and gallery, each having a fireproof floor of iron, steel, and concrete. There was a fireproof curtain, and the building would be lighted throughout by electricity. There would be two exits from each tier of seats, and there would be two exits from the stage. The Chairman said the plans were of a highly technical nature, and it was a matter which involved a considerable amount of money. They therefore proposed that Mr. Leeson should act as assessor to the Court, and that he should examine the plans in consultation with the architect. The Bench adjourned the application for a fortnight.

**ACCIDENT HOSPITAL, POPLAR.**—On the 11th inst. the Prince of Wales opened the Poplar Hospital for Accidents, which is situated in the East India Dock-road. The old building, which was at first a Customs House and afterwards a hotel, had already suffered much from the alterations which it had undergone. The committee of management, therefore, decided in the year 1890 to rebuild the hospital, and obtained the services of Mr. Kowland Plumb to draw up plans in accordance with the requirements of the site. Land and houses were obtained on the east side of the building for the erection of a new block of wards, the old structure being internally modified. The whole of the outdoor patients' department, comprising the waiting-room, surgeon's room, examining room, and dispensary, is located in the basement of the new wing, while the three floors above form three wards, each arranged for twenty beds. On the floor above them are the kitchen, scullery, and some bedrooms. The re-arrangement of the old building has provided accommodation for the resident staff, with a receiving and examining room for accidents, operation-rooms, &c. The buildings, old and new, are fireproof throughout. The whole of the works were carried out under the supervision of Mr. Plumb and the Hon. Sydney Holland, by Messrs. Harris & Wardrop, of Limehouse, the terracing of the grounds in the rear having been executed by the unemployed of the district.

**POLICE-COURTS, HANDSWORTH, BIRMINGHAM.**—On the 8th inst. the new police-courts which have been erected in the Thornhill-road, Handsworth, at a cost of 8,000, were opened by the Earl of Dartmouth. The public entrance to the court-room is placed at the corner of the Thornhill and Goldsill roads. The entrance-hall is 15 ft. square, and has a glazed-brick dado, extending up the stone staircase to the court, which is placed upon the first floor. Adjoining the entrance-hall is the magistrates' clerk's office, while adjoining the court is the witnesses' waiting-room, magistrates' room, &c. The entrance to the prisoners' charge-room and superintendent's office is placed in the Goldsill-road. Contiguous to the charge-room are five cells and the prisoners' yard. The policemen's day-room, kitchens, &c., are placed under the court, fronting to Thornhill-road, while the policemen's dormitories front the Goldsill-road. A superintendent's house and a house for the married sergeant are also provided. The parade-yard is 50 ft. by 110 ft., and is approached by a gateway entrance in Goldsill-road. This entrance also forms a carriage approach to the cells and the stabling. The court-room, cells, corridors, and basements are heated by hot-water pipes. Fresh warm air is admitted by flues from the external air conveying fresh air over the hot-water pipes. In summer the flues will carry fresh air only. The foul air will be extracted from the court-room and from the cells by special flues connected with the ventilating-shaft, and will be warmed by the circular pipe passing up its centre. The roofs are covered with pressed tiles, and the cells are lined throughout with glazed-bricks. The whole has been erected by Mr. B. Whitehouse, from the designs and under the superintendence of the architect, Mr. John P. Osborne.

**SEAMEN'S MISSION INSTITUTE, POPLAR.**—On the 11th inst. the Prince of Wales opened a seamen's

institute, situated in the East India Dock-road, Poplar. The main institute, which will hold 550 men, will be used for purposes of social recreation, lectures, concerts, and temperance meetings—as well as a reading-room. Over this is a room for the officers and apprentices of the Mercantile Navy, together with three class-rooms for night schools, ambulance work, navigation, and cookery, as well as for Bible classes and other religious meetings. Adjoining the institute is a coffee-bar. Rooms are also provided for the accommodation of a caretaker and two of the mission staff. The stone used was supplied by the Bath Stone Firms, Limited. The architects of the building were Sir Arthur Blomfield & Son, and the builders were Messrs. Woodward & Co., Finsbury.

**ALTERATIONS AT LLANDDOWNI-VA-FLYBY CHURCH.**—On the 5th inst. the parish church of Llanddowni Velfrey was re-opened after alterations. A new roof has replaced the old, the walls have been painted and repaired, the flooring has been renovated, new stalls have been put in the chancel, a new pulpit erected, a new belfry crowning the roof, a new vestry built on the north side, while the seats, &c., have been re-arranged. The architect was Mr. G. E. Halliday, of Llandaff.

**SWEDENBORGIAN CHURCH, NEWCASTLE.**—The foundation stone of a new Swedenborgian Church was recently laid in Park-road (corner of Cambridge-street), Newcastle. The new building will occupy a corner site at the junction of Park-road and Cambridge-street. Advantage is taken of the fall of the ground by placing the school under the church. The school entrance is in Cambridge-street, and the church entrance at the upper part of the site in Park-road. The principal front is to Park-road. The centre feature is a gable with a four-light west window with stone tracery work in the upper part, lighting the church through stained glass, in leaded lights. In contrast with this window is a short three-light window underneath, which lights the northern vestibule. To the left is the front entrance to the church. Surmounting the doorway is a gable which breaks into the flanking gable of the outer vestibule. The tower is situated at the junction of the two roads. The height of the spire is 90 ft. The whole of the external walling will be of delphstone. The accommodation is for 300 worshippers, including the small and gallery, which forms a covering to the narthex vestibule. The chancel is lighted by a three-light tracery window, and has a minister's vestry on the one side and an organ chamber on the other, with organ arches opening into nave and chancel. The pulpit stands at the corner of the chancel. The ceiling of the nave is trefoil, the lower arch being of plaster filled in between wood ribs, the upper part being of wood. The chancel ceiling is of wood divided into panels with mitred wood mouldings. The chancel arch is moulded and supported with granite shafts. The roof timbers and the internal joiners' work throughout will be pitch-pine. The vestibules have tiled floors and panelled ceilings. The schoolroom is situated in the lower story, and the floor of the church above is carried by steel girders. The entrance to the school is from Cambridge-street. A small staircase from the inner vestibule leads to the church vestibule, for the use of the scholars. The floor of the school and class-rooms will be of wood block. The heating of the church and school will be by hot water on the low-pressure system. The contracts for all trades are let at 3,000. Mr. G. H. Mauchlen is the contractor for the mason's work. The architects are Messrs. Walker & Collinson, of Bradford.

**MISSION CHURCH, BURSLEM.**—The foundation stones of a mission church at New Syth, Burslem, were recently laid. The building will be faced with buff bricks and red brick quoins, and will be in the Early English style. Accommodation will be provided for 250. The builder is Mr. N. Bennett, and the architect Mr. W. H. Walley, both of Burslem.

#### SANITARY AND ENGINEERING NEWS.

**SERVICE RESERVOIR, BISHOP'S STORTFORD.**—An inquiry has just been held at Bishop's Stortford, by Colonel Charles Henry Luard, R.E., one of the Inspectors of the Local Government Board, in response to an application by the Bishop's Stortford Local Board for sanction to borrow 3,000. for an additional service reservoir and other works at their waterworks, and 1,300. for new sewerage works at Hockerill. There was no opposition, and the proceedings were of a formal character, Mr. R. S. Scott, C.E., the Surveyor, explaining the plans and giving the necessary information to the Inspector, who afterwards visited the sites of the proposed works.

**IMPROVEMENTS AT GRAVESEND TERRACE PIER.**—The Terrace Pier, Gravesend, the pilot station for the Port of London, an iron structure erected some years ago from the designs of Mr. Redman, M.Inst.C.E., and the first in which iron cylinders were used for foundations, having after years of vicissitudes, recently passed into the hands of the Royal Terrace Pier Company, Limited, an association of Gravesend pilots, was found that many alterations and improvements were necessary, amounting to a practical reconstruction of the structure to render the pier suitable to the altered circumstances and conditions of the present day. These alterations and improvements have been

carried out from the designs and under the superintendence of Mr. J. J. Robson, C.E., of London, at an expenditure of about 7,000. The pier was re-opened for traffic on June 6. The principal improvement consists in extending the pier nearly 120 ft. into the river by the construction of a substantial iron landing-stage 144 ft. long by 24 ft. wide and 8 ft. 6 in. deep, moored by heavy cables to screw moorings in the river, and connected to the end of the pier by a light steel girder footbridge 90 ft. long, 8 ft. wide, and 7 ft. high. The effect of this improvement will be a depth of water not less than 10 ft. 6 in. at low-water spring tides. The remaining improvements comprise remaking and repaving the approach roads from the town to the pier, putting the neglected garden at the entrance into proper order, the provision and erection of a cast-iron tank holding 5,000 gals. over entrance-lodge, with mains leading to the landing-stage for supplying shipping with fresh water, provision of new entrance-gates and railings, also offices for the various bodies of pilots, and lavatories for the use of the public fitted with modern sanitary appliances. The contract for the landing-stage was carried out by Messrs. Sandford, Thames Iron Works, Gravesend, that for pile-driving by Messrs. Munday & Sons, Savage Garden, E.C., that for repairs to piers by Mr. Wilder, and that for road-making, &c., by Mr. Goose, both of Gravesend. It is anticipated that a branch line will be made at an early date from the South-Eastern Railway to the pier to develop the large and increasing river excursion traffic and to afford a West-end departure for passengers by the large ocean liners.

#### FOREIGN AND COLONIAL.

**FRANCE.**—The French Senate has voted the erection of a monument commemorating the execution of Joan of Arc, with the inscription "À Jeanne d'Arc le Peuple Français Reconnaissant." The municipal administration of Paris intends to disestablish the hospital in Faubourg Saint-Denis, known as the "Maison Dubois." The sepulchral monument to M. Alphonse is completed, in the Père Lachaise cemetery. M. Formigé is the architect, and the monument consists of a pyramid 3 metres high, bearing on one of its faces a bronze bust of Alphonse, executed by M. Dalou. There has been inscriptions at Belle Lettres has granted a sum of money to Père Delattre, well known for his works on archaeology, for the continuation of the excavations undertaken at Carthage. M. Grandin, architect, has been commissioned by the municipality of Aurillac to erect a large group of scholastic buildings in the town. The Municipal Council of Sancerre has commissioned M. Galle, architect, to prepare the plans for a college to be built on the Place Nanette. The Municipal Council of Reims has decided on the erection of a new museum there. A bridge is to be erected over the Rance at Bèzeux, in the department of Ille and Vilaine, which is to be at least 100 metres above the waterway, so as to permit the passage of the largest ships at any time of the tide. The official engineers of the Basses Pyrénées have prepared a plan for the bridge over the Gave, to connect the department of the Basses Pyrénées with the Landes. It is to be a steel bridge on masonry piers, on the confines of the commune of Laboutan, and will be 150 metres long. The death is announced, at Chevreuse, of the painter Jacques Leopold Loustau, a pupil of Cogniet. He occupied himself principally in portraits and in religious subjects, many of the latter found place in the churches of Paris. He died at the age of eighty. The ceiling paintings by MM. Bonnat and Puvis de Chavannes are to be put up in the Hôtel de Ville at Paris as soon as the two Salons are closed. MM. Deperthes and Formigé have submitted to the Conseil d'Architecture of Paris their design for covering in with a glass roof the Cour Louis XIV. of the Hôtel de Ville, restoring it to its former condition in the old Hôtel de Ville, as a large glazed hall.

**GERMANY.**—The Emperor and Empress will be present at the laying of the foundation-stone of the new cathedral at Berlin on the 17th inst. The Emperor has given his permission to erect the proposed Bismarck monument in front of the new Houses of Parliament. A competition for the design of the statue is shortly to be announced. The site of the 1896 Exhibition has at last been decided on as the Treptow Park. The grand committee, having by 43 to 27 decided in favour of the Lietzensee site, Herr Kuhnemann, the chairman of the works committee, and several others resigned. The committee then dissolved in favour of a new executive, which is to arrange an exhibition at Treptow. The old works committee was rejected, and the grand committee practically remains unaltered, so that it is hoped there







## CONTRACTS—Continued

## TENDERS.

[Communications for insertion under this heading should be addressed to "The Editor," and must reach us *not later than 10 a.m. on Thursday.*]

**ABERDEEN CEMENT.**—Accepted for the construction of pipe sewer, 4 miles, &c., at Newstead Park-road, for the Town Council.  
 Mr. Wm. Dyack, Burgh Surveyor, Town House, Aberdeen.  
 John Bunn, 63, Deansstreet, Aberdeen ..... £236 = 9

**ACCRINGTON.**—For sewerage, levelling, paving, &c., a number of front and back streets for the General Works Committee.  
 Mr. J. Newson, Esq., Borough Engineer, Town Hall, Accrington, 10 miles, by E. Ryburn.  
 George Adams, Oswaldtwistle ..... 8 streets  
 G. Canfield & Son, Accrington ..... 3 "  
 W. H. Bury, Oswaldtwistle ..... 4 "  
 [As per schedule of prices.]

**ASHLEY & NIMBERGIANI.**—Accepted at schedule of price, for paving, kerbing, flagging, &c., Chawinkel and Edward streets, for the Corporation.  
 Mr. J. T. Earnshaw, C.E., Borough Surveyor, Town Hall, Ashley.  
 J. W. Brierley, Ashurst-under-Lyne.

**BARNLEY T. W. Ashurst.**—For the erection of coal washeries at Barnley, Lincolnshire, for Messrs. John Sharpe & Son, Mr. J. Ashurst, Carby, Lincolnshire, Stamford.  
 S. W. Patterson ..... £549  
 P. Habbily ..... 1,887  
 M. Thompson & Son, 1, 187, E. Bowman & Sons ..... 1,247  
 " Accepted.

**BAYVIEW, IN HORN.**—For horse, stables, and two cottages, for Mr. J. H. B. Cowley. Messrs. J. E. K. & J. P. Catts, architects.  
 H. E. & Matthews ..... £564  
 S. C. Smith ..... £555  
 W. Jelfe ..... 572½

**BRIERFIELD.**—Accepted for excavating, sewerage, levelling, &c., Garsfield and three other streets, for the Local Board. Mr. Jas. T. Landless, Surveyor, Local Board Office, Brierfield. Quantities by Nelson.

**Jas. Ireland, Nelson & Co., Gildford-street.**  
 ..... £319 0

**Funcheon-street (Sewering).**  
 Jos. Wadde, Buryton ..... 40 14  
 W. Hudson, Gildford-street and Collier's rd  
 John Miles, Buryton ..... 32 18 0

**BRIGHTON'S HILL.**—Accepted for 10½ in. 16,000 tons of broken pipes for the Local Board.  

	Per ton		Per ton
Pitt & Sons .....	9 3	W. Stanbridge, Broad-	8 6
John Quininton .....	7 4	James Sussex .....	7 6
John Stanbridge .....	7 3	James Graves, Southwick	6 8
W. Hudson, Gildford-street	7 3	Sussex .....	6 8
Brighton's .....	7 1	T. W. Pearsons .....	6 8

 " 100 tons accepted. " 50 tons accepted.  
 " 50 tons per yard.

E. Love.....	760	0	0	....	858	0	0
Wm. Field ..	748	18	0	....	807	18	0
C. W. Long.....	732	2	6	....	765	15	1



**REDHILL.**—For the construction of sewers and incidental work, Merstham, for the Reigate Rural Sanitary Authority. Mr. Jno. Ansie, engineer, 17, Victoria-street, Westminster, London, S.W. —

Henry Cox .....	£1,715 3 0	J. E. Broderick & Co. ....	£2,000 0 0
George Ouston .....	2,533 0 0	Wm. Cunliffe .....	1,997 19 9
George Bell .....	2,434 0 0	J. Pichthall & Son, .....	1,745 15 0
John Neave .....	2,398 3 8	Hastings .....	Accepted.
W. Coker .....	2,202 11 6		
H. D. Porter .....	2,170 0 0		

**SEAFRID (Sussex).**—For the erection of three shops and premises, for Messrs. J. & R. Underwood. Messrs. Henry Card & Son. Quantities by Mr. F. H. Humphrey, Hastings.—

W. Hill .....	£1,400 0 0	G. Chapman (withdrawn) ..	£3,599
J. Potter .....	4,375	Tagg & Co. ....	3,309
W. Wilkinson .....	3,800	C. Morling, Seaford .....	3,351
S. Peters .....	3,790		Accepted.

**SOUTHAMPTON.**—Accepted for outpatients' consulting rooms and dispensary, for the Women's Hospital, Southampton. Mr. Ingallton Sanders, architect, 29, Portland-street, Southampton. Mr. Warden .....

**STAMFORD.**—For the erection of a school for technical instruction, for the Corporation of Stamford. Mr. J. C. Traylen, architect, 10, Strand-street, Stamford.—

F. B. Thackery & Co. ....	£1,450 0 0	R. Scholes .....	£1,173 0 0
Hilson Brothers .....	1,245 10 0	J. Peasgood .....	1,104 0 0
W. H. Lyon .....	1,168 0 0	John Woolston, Stamford ..	980 0 0
Roberts Bros. ....	1,153		

**TAUNTON.**—For supplying and fixing a Stoney's patent penstock, two steel on wrought-iron bridges, building walls, &c., French Weir Fields, for the Corporation. Mr. J. H. Smith, Borough Surveyor, Municipal Office, Castle-green, Taunton.—

Phillips .....	£1,255 0 0	Allen & Son, Taunton ..	£976 10 0
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[Surveyor's estimate £1,125]

**TIPTON (Staffs.).**—For additions to Burnt Tree school building of the School Board of Tipton. Mr. Alfred Long, architect, 39, High-street, West Bromwich.—

Henry Smith & Son, Hill Top ..	£59 0 0
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[Accepted conditionally]

**TREDEGAR (Mon.).**—For taking down building and erection of a mission hall for the United brethren. Thomas Edwards, Duke-street .....

**TUNBRIDGE.**—For the erection of the new post-office at Tunbridge. Mr. J. Tush, architect. Quantities supplied:—

Mansel Bros. ....	£1,717 14 0	Langridge .....	£1,705 0 0
Penn .....	1,859 13 0	Wallis .....	1,630 0 0
J. O. Richardson ..	1,724 0 0	Jones .....	1,531 9 2

**TUNBRIDGE WELLS.**—For the erection of the Royal Ashdown Forest and Tunbridge Wells Golf Club House. Mr. T. Harrison Myers (Myers, Vevers, & Myers), architect, Preston, London, and Blackpool. Quantities supplied:—

J. Waters .....	£2,000 0 0	J. Longley .....	£2,495 0 0
W. S. Denne .....	2,550 0 0	J. Morris .....	2,340 0 0
E. Steer .....	5,771 8 0	Job Luxford, Forest ..	2,215 0 0
Mansfield & Son ..	2,266 0 0	Row (accepted) ..	2,215 0 0
Cook & Son .....	2,050 0 0		

**UCKFIELD (Sussex).**—For the erection of master's residence, class-room, &c., at the Grammar school, for the Governors of Saunders' Foundation. Messrs. Hy. Card & Son, Lewes. Quantities by Mr. F. H. Humphrey, Hastings:—

Sackham .....	£2,678 17 0	J. Potter .....	2,359 0 0
Seham & Son .....	2,491 10 0	S. Peters .....	2,350 0 0
Strange & Son .....	2,485 0 0	Tagg & Co. ....	2,099 0 0
W. Ellis .....	2,469 0 0		

**WARKWORTH (Northumberland).**—For the erection of four residential houses, for Mr. George Thompson. Mr. A. Ross Hunter, architect, 131 and 133, Pilgrim-street, Newcastle-on-Tyne.

**Warkworth work.**—R. & G. Brown, Amble .....

**WIMBLEDON.**—For the erection of shops, public-hall, club-room, &c., at Worpole-road, Wimbledon, for the Wimbledon Swimming Baths Company, Limited. Mr. Alfred Geo. Oiley, architect, Wimbledon. Quantities supplied by Mr. A. Johnson, 50, Imperial Buildings, Ludgate Circus, E.C.4.—

Holliday & Greenwood .....	£3,597	Shop fronts ..	Total.
B. E. Nightingale .....	3,000	462	£4,437
Parsons & Townsend .....	3,940	396	4,336
Ansell .....	3,595	330	4,275
Harmer .....	3,761	434	4,215
Lorden & Son .....	3,771	360	4,137

**WATTS TOWN (Wales).**—For the erection of a chapel, for the Baptist Denomination.—

Rees Bros. ....	£1,040 0 0
Chas. Jenkins & Son, North (accepted) ..	1,935 0 0

**WINLATON (Durham).**—For alterations, &c., to the Primitive Methodist chapel. Messrs. Thompson & Selby, architects.—

**For a school.**

W. Douglas .....	£290 0 0
R. Smith, Tyne-street, Winlaton (accepted) ..	258 17 6

**T. Waugh .....**

**C. Robson .....**

**Plumbing.**

**W. Ryle .....**

**Slaters.**

**E. Beck & Son .....**

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47 and 49, ST. ENOCH-SQUARE.

CYLINDERS FOR HOT-WATER CIRCULATION.

# The Builder.

VOL. LXVI. No. 2686.

JUNE 25, 1904.

## ILLUSTRATIONS.

Selected Design for Christ's Hospital Schools: General Plan and View.—Messrs. Aston Webb and E. Ingress Bell, Architects	Extra Large Ink-Photo.
Christ's Hospital Schools: End Elevation of Central Hall towards School Quadrangle.—Messrs. Aston Webb and E. Ingress Bell, Architects	Single-Page Photo-Litho.
Plan of Central Hall and Class-rooms, Christ's Hospital Schools.—Messrs. Aston Webb and E. Ingress Bell, Architects	Single-Page Photo-Litho.
Plans of Boarding House, Christ's Hospital Schools.—Messrs. Aston Webb and E. Ingress Bell, Architects	Double-Page Photo-Litho.
Sculpture at the Royal Academy: Bas-Reliefs, "Night" and "Dawn."—Mr. F. E. E. Schenck, Sculptor	Two Single-Page Ink-Photo's.

## Blocks in Text.

Diagrams showing treatment of Apse in German Medieval Churches. Pages 473, 474, 475	Designs for Jewellery. Page 478
Diagram of Adams' Patent Sewage Lift.	Page 487

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### Treatment of the Apse in the Medieval Churches of Germany.



CONSIDERABLE attention has of late been given by architects and archaeologists to the remarkable manner in which the builders of Medieval German churches planned

In early times the altar of the church was brought forward much more than in later, and the bishop and his clergy sat in a throne (stonebenches) behind the altar. This arrangement was by no means confined to Roman churches, because we find proofs that it originally existed at Norwich Cathedral, where the bishop's seat in the apse has been recently brought to light, and at Augsburg, in Germany, where the throne and altar still remain in the western choir of the Cathedral. Of course, this necessitated the altar being placed either under the arch opening into the apse, or even in advance of it, so that the apse did not enclose the altar; and the object seems to us to have been to design the apse in such a way as to include the altar within it, converting it into a large kind of "lantern" which should surround both choir and altar. At St. Maria zu Capitol at Cologne we find this was done by erecting three apses with the aisle running all round them. This is the only example of a triple chevet that we know of, though it is possible that the same plan was originally followed at Tournay Cathedral; but when the long, and certainly magnificent, thirteenth-century choir was built, the Romanesque arrangement disappeared, and the side apses simply became apsidal transepts.

The idea of returning the apses at the sides of the building was evidently an early one, because we find in the Chapel of St. Stephen at Ratisbon, which is said to have been the former Cathedral, apses formed in the thickness of the walls, which run the whole length of the building, four on either side. The building appears to date from the tenth century, and may possibly have suggested the triapsidal arrangement of the Rhineland churches.

We must, however, now attempt to trace the development of the Romanesque plan into the chevet and other later apsidal arrangements in the German churches, and we shall find a valuable link in the church at Ahrweiler (1245). Here we have the three apses, the centre one in the usual position terminating the choir, but the side ones not placed at right-angles to the centre apse, as in the Rhenish Romanesque churches, but having their chords at an angle of 45 degrees to that of the centre apse (fig. 1). An almost similar arrangement is to be noticed at the east-end of the churches of St. Catherine at

Oppenheim (1262) and St. Nicolas Auklam. Now it is only one step from this to the

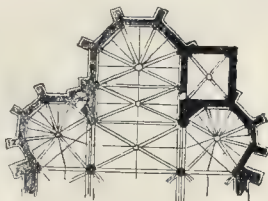


FIG. 1.—Ahrweiler.

beautiful arrangement of the apses of Xanten, and the Liebfrauenkirche at Treves; it is simply to double the apses on either side, continuing their chords upon the same line, leaving a square compartment on either side which forms the last vaulting bay of the choir aisle, and we have the eastern termination of Xanten (fig. 2). Add apsidal

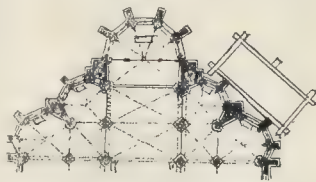


FIG. 2.—Xanten.

transepts and repeat the whole arrangement westward, and it gives the plan of the Liebfrauenkirche at Treves. Now the external effect of Xanten seen from the east is that of a lantern building, and one expects to see the same features repeated westward, as is the case at Treves; the idea evidently being a vast lantern enclosing the altar of the church. At Treves, the high altar is still brought forward two bays west of the eastern apse, and must always have been so, as there is an original doorway in the eastmost bay of the apse. At Xanten, however, the present high altar, dating from the commencement of the sixteenth century, is in the apse, but, as the choir of the church is very long, it may be that the original altar was more to the west. It is somewhat remarkable that amongst the various churches copied from Treves—Kaschau, in Hungary, for instance—it does not seem to have suggested itself to the builders to omit

and erected their apses, and the point has been discussed at some length in three works recently issued. The first, in point of date, is a paper which was read before the Royal Institute of British Architects in 1891 upon "Some Churches in the Neighbourhood of Cleves," by Mr. H. W. Brewer. The second, Sir Frederic Leighton's address upon Medieval German Art, to the pupils of the Royal Academy, last year; and the third, a paper by Mr. J. Tavenor Perry upon "The Influence of the Hanseatic League on the Architecture of Northern Europe," read before the Institute on May 28.

Now all these gentlemen seem to agree that the apsidal treatment of the German Gothic choir (where, of course, it was not, as is the case at Cologne, simply a copy of French work), grew out of the Romanesque triapsidal arrangement, of which so many examples exist upon the banks of the Rhine, notably St. Martin's and the Apostles' Churches, at Cologne; St. Quirinus, at Neuss; the Minster Church at Roermond; Herzogenrade Brauweiler, and the cathedral at Mainz, &c.

Sir Frederic Leighton does not like the triapsidal arrangement, and considers it destructive of the general unity of design, as it withdraws the eye from the central apse, which should be the leading feature of the scheme; while Mr. Perry and Mr. Brewer seem to regard the triapsidal arrangement as the foundation of the original and picturesque treatment which is so interesting in the later German apses.

We think it must be allowed that the triapsidal Romanesque churches on the Rhine certainly gave the first hint for the general treatment of the German chevet, as distinguished from the French; but we are of opinion that another idea was also influencing the German builders.



the central square, with its columns A, B, C, D on plan (fig. 3), making the columns

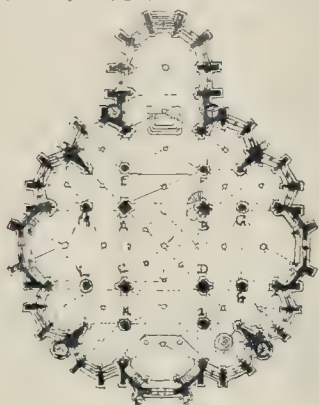


FIG. 3. *Treves.*

E, F, G, H, I, K, L, M support the centre portion of the building, which would have formed an octagon, and have given far more internal evidence of the lantern formation of the church, which at Treves is more apparent from the plan and exterior than from the interior. It is true that there would be a space to vault, measuring 65 ft. from east to west, and the same from north to south; but the great octagonal church of the Karlslof at Prague measures 72 ft. each way, and is vaulted in stone.

As we have shown how the idea of converting the eastern portion of a church into a lantern influenced the arrangements developed from the triapsidal Romanesque plan, let us now point out the remarkable indications which we find of the same idea in choirs which have only a single apse. In the eastern choir at Worms the cardinal sides of the three-quarter octagon apse, instead of being at right-angles to the chord of the apse, bend in slightly, suggesting a horse-shoe form, and externally the appearance of a lantern; the idea is accentuated by an octagonal tower rising over it, the whole, when seen from the east, distinctly conveying the idea of a lantern-formed church to which the long nave was a sort of adjunct (fig. 4).



FIG. 4. *Worms.*

This idea will be found also in the later and thoroughly developed Gothic apses of the Cathedral at Aix-la-Chapelle; St. Ludgerus at Münster; St. John's, Stettin, &c. In each case the sides of the apse nearest to the nave, or choir, spread out so as to make the apse wider at the end of its first bay than at its junction with the choir, giving distinctly the impression of a lantern both internally and externally. The altar placed in such an apse

as this really stands in a lantern with light coming in all round, and with one of those sumptuous painted reredoses which the Germans delighted in, and brilliant glass in the windows, the effect was gorgeous in the extreme.

The German chevet apse (fig. 5) is always

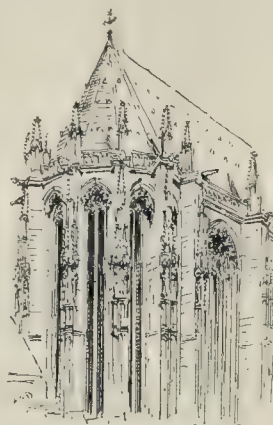


FIG. 5. *Aix-la-Chapelle.*

more or less of a compromise. The idea was certainly borrowed from the French, and challenges comparison with the magnificent French examples. It must at once be acknowledged that Germany cannot produce any chevet to be compared with those of Amiens, Bourges, Rheims, &c. Mr. Tavenor Perry tells us that in the north of Germany the apse of Lubeck Cathedral with its chevet influenced the church architecture through the Hanseatic league; if so, all we can say is that German architecture has no particular debt of gratitude to the "Hansa," for if this be the case—and we see no reason to dispute Mr. Perry's assertion—some of the very worst features of German chevets are to be traced to it, amongst others the making the five arches of the apse unequal in span, the making the vaultings of the chapels of the chevet apse spring from the columns of the apse instead of from the responds of the aisle; the bald appearance of the clearstory, and the strangled Lady Chapel. We cannot see in this apse much influence of the old triapsidal treatment. It seems to us simply a bad copy of a French chevet with a blundering attempt to give a lantern character to it by making the cross arches which divide the chapels radiate from the centre instead of the chord of the apse; all these defects are to be seen over and over again in German chevets, especially in the north.

One of the best-designed and most original chevets in Germany is that of the Cathedral at Freiburg (fig. 6), a late work dating from

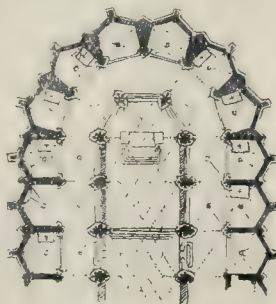


FIG. 6. *Freiburg.*

1471-1513, according to Kugler,\* and by an

architect from Gratz of the name of Niesenberger. It is, in reality, a three-sided apse, and as the aisle is rather wide, the expansion of the radiating cross arches of the aisle was so great as to leave immensely wide spaces in the external wall of the aisle. If that also were kept three-sided; instead of this they made the outer wall of the aisle six-sided, which gave them two chapels, opposite each arch of the apse, keeping all the chapels the same width. Externally there are two flying buttresses to each angle of the apse, which with their pinnacles give a very rich and intricate appearance, and convey that lantern-like effect which the Germans delighted in. Freiburg may be taken as a typical representation of the South German treatment of the chevet, just as Lubeck is of the North German idea; and one sees directly that the South Germans, while borrowing the idea from the French, made it their own, and treated the thing in an original manner, whereas the North Germans made but a poor imitation and never succeeded in doing anything with it.

The chevets of the Cathedral at Prague, by Peter Arler, of Gmünd, and of St. Barbara at Kuttenberg, show the originality and beauty with which the South German architects treated this feature; and one thing always strikes us, the lantern-like grouping. The immensely lofty apse of St. Barbara's, Kuttenberg, standing on the top of a rock overlooking the river, has a most charming effect, and, seen from the opposite bank, looks just like a stone lantern.

The treatment of the apse in the "Hallenkirchen," or hall-formed churches, is often very skilful and interesting in South Germany, but generally eccentric and peculiar in the North. The aisle sometimes returns round the apse and forms a chevet, or, in other cases, it stops short, leaving an aisle-less choir. The finest examples of each treatment which we know of are at Holy Cross Church, Schwabisch-Gmünd, in Würtemberg, and at St. Martin's, Landshut, Bavaria. The noble Hallenkirchen of Munich, Ingolstadt, Amberg, and Nördlingen offer examples of such a structure with the chevet, but in none is the treatment so skilful as at Schwabisch-Gmünd. Here the apse has three sides, and from each side a square compartment of vaulting crosses the aisle, which is the same height as the choir itself (figs. 7, 8), and these three square bays are



FIG. 7. *Schwabisch-Gmünd.*

so arranged as to leave four triangular bays between them, which spread out so as to form seven bays upon the only wall of the apse.

\* "Kunstgeschichte Zweiter Band," p. 509.



At Munich and Nördlingen, instead of the aisle working round the apse, the nave is

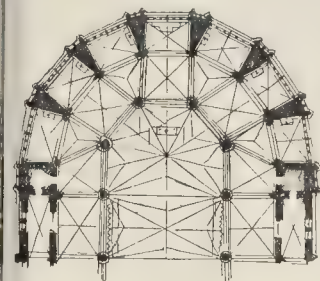


FIG. 8.—Schwabbisch-Gmünd.

carried on a bay further east, so that the canted sides of the inner apse abut against the angles of the outer wall of the apse. The effect is eccentric and ugly. The Germans were fond of playing tricks of this kind with their apses, and in nearly all such cases the effect is bad. Sir Frederic Leighton is very severe upon a somewhat similar arrangement of the apse at Augsburg Cathedral, which he describes as an attempt to crowd a chevet round a square-ended choir. The apse at Augsburg is not, however, square in plan, but the cant of its side bay is very slight, and the clearstory has a large window in the centre bay and very small ones in the canted bays, so that the general effect is that of a square-ended church when viewed from the nave; but one has only to walk round the chevet to see that both the outer and inner end walls are really apsidal. Another still more eccentric piece of planning is the east end of the church at Prenzlau. The nave and aisles of this "Hallenkirche" are terminated to the east by a huge gable, the whole of the upper portion of which is panelled like window tracery (in brick). The lower part of this *façade* is pierced by a series of arched openings within which are constructed three very eccentric apses. The centre one has a large centre bay, which forms part of the *façade*, and the two much smaller canted bays receive a borrowed light from the arched recesses; the two side apses at the ends of the aisles have no centre bay, but are simply triangular in plan, their windows all receiving their light from the arched recesses. So that, in point of fact, the church may be said to be apsidal internally and square-ended externally. This produces exactly the opposite effect to Augsburg. There are, of course, many apses in Germany which entirely follow the French plan and arrangement of chevet. The Cathedral of Cologne is the typical example.

In the south of Germany, the apse is often turned in such a way as to present an angle instead of a side in the centre. The Thein and Karlsrufer churches at Prague are pretty examples. This seems another of those attempts to give the east end of the church that "lantern effect" to which we have previously alluded.

By far the most interesting examples of apsidal treatment in Germany are the various attempts to obtain a lantern-like east end by developing the old Romanesque triapsidal termination—such, for instance, as Ahhrweiler, Xanten, the Liebfrauenkirche at Treves, Kaschau in Hungary, one of the churches in Zoest, &c. If we may class the polygonal churches under this head, there are many in Germany which are well worthy of study. St. Gereon at Cologne is a noble example, with its twelve sides set out upon an oval instead of a circle. This church deserves to be most carefully studied, as it is one of the most original works executed during the Middle Ages, and would admirably adapt itself to modern requirements. So also does the Karlsrufer Church at Prague, with its great octagonal nave, 72 ft. each way without any columns. That the fine vaulting which

covers the octagon is strongly constructed is proved by the fact that during the siege in 1757 the church was struck by 807 cannon balls, set fire too, and everything inflammable burnt, but the grand vaulting lasted through it all.

The interesting Church of St. Roch, at Prague, though late (1599), is also polygonal. The "Neu-Piarr" Church at Ratisbon, the Pfarrkirche at Naumberg, St. Catherine's Hospital at Ratisbon, and the churches of Oberwittighausen and Grünfeldhausen are also polygonal. The former has a square tower rising over the centre of the nave, and the latter consists of a large octagonal nave with a small octagonal chancel and an octagonal turret rising from a very deep arch between the two. Both of these churches are more curious than valuable, as offering hints for modern application.

There are in Germany, as with us, many round or "temple" churches, such as those at Fulda, Würzburg, &c. They are interesting to the antiquary, but do not deliver any special message to the architect.

There can be no doubt that both the kind of treatment at Treves, and the great polygonal churches like St. Gereon, Cologne, offer ideas for modern churches which deserve careful consideration, as skilful modification might develop from them great unencumbered churches capable of accommodating large congregations at a reasonable cost, which is certainly felt to be one of the wants of our day.

#### THE HISTORY OF TRADES' UNIONISM.\*

**T**HE Trades Unions have for so many years played so large a part in the history of this country, if we regard history from a wide and a proper standpoint; they have, and are likely to have, so vital an influence on the future of Great Britain; that a full and accurate account of their growth and progress had in truth become a necessity. We have no fault to find with the way in which Mr. and Mrs. Webb have done their work. It would be easy to criticise adversely small faults of style and taste, but these must be forgiven when we recognise the labour that they have given to the task, and to the thorough way in which it has been fulfilled. Nor should we omit to praise those biographical touches which have given a personal interest, and even a picturesqueness, to the work, and have preserved for us the portraits of men who have played a very important part in the labour movement of the century.

Nor is it unreasonable in us as Englishmen to congratulate ourselves on the moderation and good sense which have been conspicuous features as a whole in the growth of this movement; it has been one, not of a violent and revolutionary kind, but of a constitutional and practical character. The position which trades unions now hold has been obtained by individual effort, and by the legitimate and unwearied labour of the workmen of the country. It has, happily, in the past been characterised by an absence of socialism and of a dependence on State influence which may not be so conspicuous in the century on whose threshold we stand. It has been a struggle for recognition and for existence on the part of the unions, which has been successful, and which may, if the signs of the times are correctly read, become a struggle of an offensive rather than a defensive character, an attack on capital and not a defence of labour.

Passing to this work itself we find that the first part is occupied in showing that there is no real connexion between the modern trades union and the Mediæval guild. It is as well, perhaps, to clear the air, so to say, in this respect, but the connexion, if it existed at all, is of little

importance, though in truth it is not a fact. The Mediæval guild was much more a society of masters than of men, and was not in any sense a union of artisans: its chief efforts were to increase the power of capital and to give into the hands of the more wealthy traders the municipal government of the English towns. But in truth it would not be easy to say definitely what date should be ascribed as that at which trades unions began to exist. Early combinations were invariably loose and unsystematic, and it is not until they became numerous that their existence was regarded as an actual fact. Thus we read that in 1717 "the Mayor and Corporation of Bradninch complain that for some years last past the woolcombers and weavers in those parts have been confederating how to incorporate themselves into a club." Here we have an instance of something in the nature of a trade union among the woolworkers of Devon and Somerset long before it can be definitely said that the system of trades unions had any recognised existence, and this same fact indicates the difficulty, and in truth the error, of endeavouring to give any actual time as a beginning of these societies. The most important feature, however, in regard to combinations of artisans in the eighteenth and the beginning of the nineteenth centuries is perhaps the legislation against combinations. In 1799 an Act of Parliament (39 George III., c. 81) "expressly penalised all combinations whatsoever," and this statute was reaffirmed and amended by another Act in the following year. This legislation did not, however, prevent the existence and the increase of trade societies, but it was not until 1824 that these Acts were repealed. In the following year another Act was passed, which, though it minimised the Act of the preceding year, "effected a real emancipation. The right of collective bargaining, involving the power to hold labour from the market, was for the first time expressly established; and although many struggles remained to be fought before the legal freedom of trades unionism was fully secured, no overt attempt has since been made to render illegal this first condition of trade union action." In other words, at the end of the first quarter of this century the principle of the trade union was recognised as being legitimate, and as soon as this step was accomplished it was obvious that a further development of the system was solely a question of time. A recognition of a principle of this kind could never be retraced, and the tendencies of the times were certain to assist in its enlargement. With this date, therefore, ends one period in the history of trades unionism, just as of necessity another commences. This result was largely owing to the vigour and intelligence of a man named Francis Place, who was originally a tailor, and who devoted his time to the repeal of the Combination Acts, and then to the Reform movement. He was, in fact, a thorough master of the art of getting public attention directed to a subject; he kept himself in constant contact with all phases of the trades union movement, and he was always at hand to prompt and to press politicians and journalists. He was a master in amassing telling facts and statistics, and was the forerunner of the numerous remarkable men who figure conspicuously in the history of trades unionism in later years. "He intervened in every strike, sometimes as a mediator, sometimes as an ally of the journeymen. He opened up a voluminous correspondence with trade unions throughout the country, and wrote innumerable letters to the newspapers. In 1818 he secured a useful medium in the *Gorgan*, a little working-class political newspaper subsidised by Bentham and Place himself. This gained him his two most important disciples, eventually the chief instruments of his work, J. R. McCulloch and Joseph Hurst." The succeeding period to the year 1842 the authors of this work call "The Revolutionary Period," a designation which, in our opinion, is scarcely correct. It is easier to criticise

\* "The History of Trades' Unionism." By Sidney and Beatrice Webb. London: Longmans & Co., 1894.




than to formulate, but this is rather a period of growth and expansion: of the creation of unions and of strikes. It is "the wild freshness of morning" in the life of English trade unions. A chief feature of the period is the formation of a "Grand General Union of the United Kingdom" which was followed by the "National Association for the Protection of Labour" to which a "National Potters' Union" was presently affiliated. This Association appears to have expired about the year 1832, but its place was filled by other general trade societies, the most important of which was the Builders' Union, or the General Trades Union, as it was also called. "It consisted of the separate organisations of the seven building trades, viz., joiners, masons, bricklayers, plasterers, plumbers, painters, and builders' labourers, and is, so far as we know, the solitary example in the history of these trades of a federal union embracing all classes of building operatives and purporting to extend over the whole country" (p. 110). This union is, it would seem, much more strictly the progenitor of subsequent unions than anything yet noticed in this history: it had "an elaborate constitution, in which it was attempted to combine a local and trade autonomy of separate lodges, with a centralised authority for defensive and aggressive purposes." It was stated in the rules that "the object of this society shall be to advance and equalise the price of labour in every branch of the trade we admit into this society," an object which is essentially that of the trade union of the present day. It cannot be a surprise that the creation of such a society was followed by a conflict between capital and labour. The year 1833 saw the struggle, and from this date we are constantly confronted by the birth of fresh unions and the beginning of new strikes. "The unions of trades," wrote Lord Melbourne, the then Home Secretary, in September, 1831, "in the north of England and in other parts of the country for the purpose of raising wages, &c., and the general union for the same purpose were pointed out to me by Sir Robert Peel as the most formidable difficulty and danger with which we had to contend, and it struck me, as well as the rest of Her Majesty's servants, in the same light."

No better evidence could be given of the progress which trade unions had made, how they had become societies of great power and had forced their way thereby on the attention of the nation. But they were too strong for any Government to bring in legislation against them, nor was Lord Melbourne the sort of statesman who would venture on such rash adventures. It was left to the masters to put the law in motion against artisans and to fight them by means of lock-outs, and the period of some of which we are writing thenceforth continues and ends with industrial war between capital and labour. With this we practically close yet another epoch in the history of trades unions. "For the next quarter of a century we shall watch the development of the new ideas, and the gradual building up of the great 'amalgamated' societies of skilled artisans with their centralised administration, friendly society benefits, and the substitution, wherever possible, of industrial diplomacy for the ruder methods of the class war." It must be confessed that most of us who have been in the habit of watching contemporary events can hardly regard this as a just description; class war and strikes did not die out, and are yet with us, and industrial diplomacy has not averted many conflicts. The era of arbitration and diplomacy is that which some look forward to as about to commence in the twentieth century. With that we are not now concerned. What we desire to point out is that by the middle of the present century the history of trade unionism had begun to be characterised by the same features which mark it now, and have marked it for some time past,

though by reason of the better position of the artisan, strikes are now in their character rather aggressive than defensive. Into this later period we do not propose to enter; it is within the knowledge of many of our readers, in it there have been numerous sectional and local developments of great importance to the interests both of capital and of labour; and there have also sprung up two schools of trade unionism, now popularly known as the old and the new unionism. These latter are facts with which we are all of us daily reminded, but into them we shall not now enter. It must suffice to have indicated some points in the earlier history of trades unionism which are less likely to come under the notice of the present generation, and which are more strictly in the nature of historical events. But we may add that all who are interested in the well-being of capital and labour, all who look upon history as being something more than a narrative of wars and of international conflict with arms or pen, will find in this volume abundant food for consideration and reflection.

#### NOTES.

HE Society for the Protection of Ancient Buildings held its seventeenth annual meeting on Thursday evening, June 14, in the old hall of Clifford's Inn, Fleet-street, with Mr. J. T. Micklethwaite in the chair. The adoption of the Society's annual report was followed by the reading of a paper by Mr. Heywood Sumner on "Protection and Prevention." The paper, which was very short, referred to the objects of the Society and dealt with the necessity of protecting old buildings being almost greater than that of objects of antique art in museums, principally on the ground that the buildings were not removed, but stood there in their original position as exponents of the soul of a past age and its artists. Mr. Sumner lamented the lack of environment which is necessarily attached to the exhibition of art objects in a museum, and also regretted the productions of the present day, and seemed confident that in the future the buildings of to-day would scarcely excite sufficient interest to make protection in the future a necessity. Whether Mr. Sumner is entirely qualified to pronounce upon this point may be open to question. At the conclusion of the paper Mr. William Morris proposed a vote of thanks to Mr. Sumner, which was seconded by Mr. Reginald Blomfield. The result of the Society's work, which appears in its annual report, gives many interesting details of the ease with which ignorant committees and others can hopelessly disfigure most interesting historical monuments in this and other countries. Of the City churches, which are continually finding work for the activity of the Society, All Hallows the Great, now being demolished, and St. Ethelburga, which is threatened, are both mentioned, as are the following churches, which, under the efforts of the Bishop of London, are scheduled for union, which probably means the removal of one of them:—St. Edmund the King, Lombard-street with St. Mary Woolnoth; St. Edmund the King with All Hallows, Lombard-street; St. George, Botolph-lane, with St. Mary-at-Hill; St. Michael Bassishaw, with St. Michael, Wood-street; St. Ethelburga, Bishopsgate, with St. Helen. An interesting account is given of the Old Palace at Bromley-by-Bow, which was acquired by the London School Board, and completely demolished before the Board were aware that they possessed a magnificent specimen of an Elizabethan mansion constructed on the E plan, which was capable of restoration and adaptation to their needs. The account of this transaction will appeal to Mr. Selwyn Image, who recently pleaded at the Society of Arts for more artistic environment for the scholars of elementary schools, and a splendid opportunity here seems to

have been lost. The report is full of interesting particulars of old buildings and structures in this Kingdom and on the Continent, and contains also a report by Mr. Somers Clarke of the steps now being taken in Egypt for the preservation of its monuments. As a statement of facts relating to the buildings, the report is excellent, but in reference to certain restoration works which have been carried out in a thoughtful and conservative manner, many of its criticisms, as usual, are but flimsy, and appear intended to carp at what has been done, rather than to suggest a better course.

THE foundation stone of the new Berlin Cathedral was laid with some ceremony on Sunday last, the Emperor, Empress, and the Royal Family attending. In accordance with the German custom, every member of the Royal Family, headed by the Emperor, "hammered" the stone three times, the "hammering" being then repeated by the Ministers, the heads of the Government departments, the officiating clergy, and finally by the architect, Professor J. C. Raschdorff. It is, perhaps, of interest to note that, according to a document placed under the stone, it was one of the late Emperor William's last commands that the Cathedral should be built by "the ruler and the people of Prussia to commemorate the victory over the French in 1871 and the foundation of the New German Empire." The design of the new Cathedral was published in the *Builder* last month, together with an article on its history.

THE traders' representatives in the House of Commons have lost no time in laying their views upon the railway rates question before the new President of the Board of Trade. A deputation waited upon Mr. Bryce on Friday, urging him to strengthen the Railway Rates Bill brought in by his predecessor—which was considered by them inadequate to the occasion—and also requesting him to secure facilities for the passage of the measure through the House. Mr. Bryce, in reply, said that he thought the Bill would be endangered if it were altered, but, in inviting the co-operation of the deputation to get it passed as it stood, promised to consider any suggestions as to amendments which would not be likely to arouse opposition. One result of this interview has been the removal of various amendments to the Government Bill, which will thus stand a better chance of an early second reading. It is, however, still intended to endeavour to induce the Government to incorporate in their measure parts of the Bills brought in by Sir James Whitehead and Sir A. K. Rolit. The former of these Bills deals principally with the extension of the powers of the Board of Trade (or the Railway Commissioners) with regard to determining the reasonableness of rates; and Sir Albert Rolit's, with the composition of Railway Commission. Mr. Bryce stated on Friday that the Government could best deal with the latter question in filling up a vacancy, and there is no doubt that someone of commercial experience will be appointed when such a vacancy occurs.

IT is satisfactory to find, from the answer of the President of the Board of Trade in the House of Commons last week, that the Department is alive to the inconvenience which the public suffer from the manner in which the names of railway stations are now often indistinguishable from advertisements. Mr. Bryce, however, does not give much comfort as regards existing stations, being under the impression that he has no jurisdiction to interfere with them. It is quite clear that, if he is correct in this view, then the Board of Trade should bring in a Bill to empower it to regulate the placing of names of stations on platforms, so as to be perfectly clear, and quite separated from advertise-



ments. A Bill of a single clause would be sufficient, and it could be passed through Parliament without delay or difficulty. The railway companies have shown no disposition to look to the public convenience in this particular matter, and therefore Parliament, as representing the public, must step in.

AN example has recently occurred at Hendon of the unreasoning tyranny to which contractors and workmen are subjected by the trade-unionism of to-day. It appears that at some buildings which are being carried out by Messrs. Holloway Bros. at Hendon Station for Messrs. Schweppe & Co., work has been suspended because the bricklayers have discovered that the foreman, who has been engaged on various works by Messrs. Holloway Bros. for the past ten years, is a non-society man. He apparently saw no necessity to join the union, and accordingly the bricklayers intimated to the firm that they would cease work unless the foreman either joined the union or was superseded. Messrs. Holloway saw no necessity for this, and accordingly the men ceased work. Since then the firm have advertised for bricklayers, and in a day or two filled up about one-half the vacant places. Meanwhile the entrance to the works has formed the rendezvous for the men who have left their employment to assemble. The master builder is only bound by the rules of the organisation as written or printed, and we are informed that in these there is no stipulation whatever as to his being precluded from employing either union or non-union workmen, much less a foreman of works. It does not appear that the men have any complaint to make against the foreman except the mere fact that he does not belong to a union, and on this pretext work is stopped and men who might be earning money and supporting their families are idling about.

THE sanitary condition of the Uxbridge Rural Sanitary district is the subject of a long report by Mr. Evan Evans to the Local Government Board. The report deals successively with the conditions of water-supply and drainage in seven areas in the district, distinguished as Hillingdon (part of)-with-Cowley, West Drayton, Harefield, Hayes, Ickenham, Northolt, and Ruislip. Speaking generally, the district is roughly divided into a northern grazing and meadow district, situated on the London Clay and Reading Beds, and a southern brick-making and arable district situated on the high-level gravel and the brick earth of the Thames valley. There is at a moderate depth an abundant supply of underground water in the gravel, and it is from shallow wells dug into this gravel that the majority of the inhabitants draw their supply. Owing to the loose texture of the gravel the water in these wells is being constantly renewed, and they are, therefore, very liable to be polluted by substances soaking into them from the surrounding soil, especially after heavy showers of rain, when the majority are said to show signs of turbidity. They are nearly all merely dry-stained, and only a few are provided with proper copings and covers. Cesspools, cesspits, manure heaps, and buried privy and cesspool contents are often in dangerous proximity to the wells, the position of the latter in several instances being unknown to the inhabitants. Little use is made of shallow wells in the clay district owing to the inadequate quantity and unpleasant taste of the water that they yield, and, with a few exceptions, the inmates of isolated farmhouses and cottages have to content themselves with water obtained from brooks, ponds, or canals, or with rain-water from the roofs. The larger villages possess supplies from deep wells sunk into the chalk, which wells have generally been provided by the generosity of private individuals and are now kept in repair by the sanitary authority; but there is no means of distributing the water by pipes or otherwise

to the surrounding neighbourhood, so that the area supplied is necessarily limited to dwellings within the comparatively short distance to which it is practicable to carry water by hand from the well; a serious and constantly recurring sanitary evil. There is nowhere any system of properly constructed sewers except at Harefield, and a small portion of Colham Green: and even in these places the sewers are incomplete, being only provided with manholes for inspection and without any means of flushing or ventilation. The remaining portions of the district are either unprovided with any means of sewage disposal or else have been sewered piecemeal, highway drains having been utilised for conveying sewage, foul ditches piped in, and occasional sections of glazed socketed pipes laid down where the old culverts have settled or become silted up. The insertion of catchpits along the course of the sewers has converted some of them into elongated cesspools. The cesspools are generally constructed with loose bricks, and when situated in a porous soil they hardly ever require any emptying, since their contents soak into the ground. Where, on the other hand, the cesspools are sunk in an impervious clay soil, or have been recently constructed in connexion with newly-erected dwellings, and rendered watertight according to the authority's by-laws, no soakage occurs, but they quickly become full, and to prevent their contents overflowing they must be frequently emptied. The removal of house refuse is not undertaken by the authority, and the byelaws with respect to this matter are almost entirely disregarded, with the result that large heaps of refuse are found on the premises of nearly all the cottages throughout the district. It is added that "on account of the character of the industries in the district there is but a slight prospect of any improvement in this respect in the more populous portions unless the authority will themselves undertake the removal of house refuse and privy contents." This also is an old and constantly recurring evil in rural districts, where people will not empty privies and cesspools at proper intervals unless the matter is compulsorily dealt with by the authorities.

THE Ecclesiastical Commissioners have framed a scheme, under the Union of Benefices (Metropolis) Act, 1860, for uniting the benefice of St. Alban, Wood-street, with St. Olave, Silver-street, and the benefice of St. Michael, Wood-street, with St. Mary Staining. The scheme makes St. Alban the parish church of the united benefice, and provides for the demolition, with sale of the site, of yet another of Wren's City churches—St. Michael's. That church was completed in 1675 at a cost of 2,554*l.*: some arches of the earlier fabric were preserved in the west wall. The interior is spacious and well-lighted, and has an ornamented coved ceiling: in 1831 the tower, at west end, was opened to the body of the church. The east end is a well-designed example of a composition often adopted by Wren under similar conditions: a basement or stylobate carries four Ionic pilasters, which support an entablature and angle-pediment; from the tympanum projects a bracket-clock; between the pilasters are three round-headed windows having modillion key-stones. The organ, by Elliott (1800), enlarged by Eagles and Gray & Davison, the carved work, with other fittings, will be transferred to St. Alban's, or otherwise disposed of by sale or gift to a new church to be built within the metropolitan district. The scheme further gives a capital sum of 600*l.* for maintaining in good order the dissused churchyards of St. Olave and St. Mary Staining, one not exceeding 1,000*l.* for rendering St. Alban's—designed in Late Gothic style, also by Wren, to replace the church attributed to Inigo Jones—more suitable for purposes of divine worship, and another of 4,000*l.* for a residence for the in-

cumbent of the new united benefice. St. Olave and Mary Staining churches were not rebuilt after the Great Fire. The latter stood at the north end of Staining-lane, next to Coachmakers' Hall, in Oat-lane: the former in Silver-street, where its burial-ground has been opened to the public by the Metropolitan Public Gardens Association. Stow avers that the embalmed head of James IV. of Scotland was taken out of his coffin at Sheen (whither, Weever says, his body was removed from Flodden Field), and carried to his house in Wood-street by Laurence Young, Edward VI.'s master-glazier, who then had it buried in St. Michael's. In St. Alban's is a rare example of a Puritan hour-glass, for regulating the duration of sermons; its brass stand, later in date, was given to the church in 1685.

LORD DILLON, F.S.A., is making, we are told, a critical examination of the Tower armoury, preparatory to a contemplated re-arrangement of the collection. This will be done, we hope, with more careful regard for matters of archaeology and fact than has been bestowed there. Though the collection is, upon the whole, but a poor one, it deserves better treatment in those respects at the hands of the State. Our more immediate concern, however, is with existing internal arrangements for what is a very popular exhibition. Some time ago, as our readers will remember,\* Mr. Shaw Lefevre started a fantastic craze for "doing something Mediaeval" at the Tower, introducing ill-advised pseudo-restorations in the Inner Ward. "Lord," said Miss Branghton, speaking of the opera-house, "I thought it would have been quite a fine place—all over I don't know what—and done quite in taste."† In 1883 they pulled down the Horse Armoury, built in 1826, along the White Tower's south wall, together with the ante-chamber adjoining, whence a staircase had been made through the wall into the upper crypt of St. John's Chapel, having in the previous year crowded all the weapons and armour into the upper two floors (except the chapel) of the keep. A more unsuitable place than the White Tower for such a purpose it would be difficult to find. The public, until lately, climbed up the staircase in the south wall (it originally communicated with the Royal lodgings), passed through a narrow gallery at its head, into the chapel and so to the rooms, including the Banqueting Hall and Council Chamber, beyond and above, leaving by a doorway near the north-eastern circular turret, Flamstead's, in the north wall. But now they both enter and leave by the north door, which stands about 14 ft. above the parade-ground, and then have to go up and down a steep, narrow, badly-lighted flight of stairs divided by a slight central rail. Upon ordinary days this course is inconvenient enough: it is positively dangerous when, as on Bank holidays, visitors arrive in their thousands to form a continuous throng, moving, or "circulating," as best they can along narrow passages, round awkward corners, through narrow galleries, and up and down novel stairs. Nor do we see why the public on taking their tickets should still be compelled to struggle through the impedimenta of a stuffy and very unsavoury refreshment (!) room. If any question of contract arises there the sooner such vested interests are compounded for the better for the visitors' comfort and the credit of the authorities responsible.

SOME time since we published an article commenting on the absurdity and vulgarity of the majority of English designs for jewellery and gold work; illustrated by a number of designs taken from trade catalogues. A correspondent sends us an illustrated circular of a company whose special object is the manufacture of imitation

\* See the *Builder* of Nov. 18, 1882; May 19, 1883; Jan. 3, 1885; and July 31, 1886.  
† "Evelina," letter xxi.



diamonds, the use of which, with recent increased excellence in manufacture, is we believe becoming much more common than formerly. To our thinking the wearing of a cheap imitation, however good, of a material which has a high value, is not in itself in very good taste, and one must regret to hear that English ladies are taking to wearing diamonds the merit of which is that "no one can tell them from real ones." But the case would be better if the imitations were at least subservient to artistic design. From the subjoined specimens, however, it appears that art has no more place with the vendors of imitation diamonds than with those who deal in the genuine article. It would be difficult to go lower in the scale of vulgarity in personal adornment than a brooch of imitation diamonds made in the form of imitation horse-shoes and a nail. The



Diamond Horseshoe and Nail Brooch.



Diamond and Catseye Brooch.



Pearl and Diamond "Mistletoe" Brooch.



New Diamond and Pearl Bracelet.

favourite use of cat's-eyes, according to the catalogue referred to, is to place them in the hinder part of a toy insect, with a pin run through it to increase the beauty of the idea (this is one out of several specimens). A bungling attempt at naturalistic imitation is the best use to which the mistletoe plant can be put; and when we come to abstract ornament the "new diamond or pearl bracelet" (observe the "new") is a delightful example of the kind of thing that passes for "design." There are a great many things just as bad in the catalogue in question; there can hardly be said to be a single thing in it that an artist would like to see his wife or daughters wearing; and the catalogue is fortified with an extract from the *Queen* stating that the company "owes much of its success to the happy artistic taste which governs the selection of all their designs. . . . The company have been at pains to revive the more approved styles of jewellery, and it is the excellence of design, coupled with the best workmanship, that make these ornaments so desirable." That is the kind of teaching in art which English ladies get from a ladies' newspaper. If the *Queen*, which has, we presume, some influence among the readers for whom it is published, would get an artist to write now and then upon ladies' ornaments from the artistic point of view, it might do something towards teaching English ladies a little more of what design in ornament really means, a matter of which they are for the most part deplorably ignorant.\*

\* With the outbursts of demented anger from jewellers and their trade organs which greeted our former criticism on the subject, were mingled sneers at the idea of an architectural journal pretending to know anything about the subject. These people do not seem to be aware that the principles

THE exhibition of paintings by artists of the Ferrara-Bologna School at Burlington Arts Club contains a few fine works and a good many curious and interesting ones. Perhaps the Virgin by Marco Zoppo (1,440-98) may be included under both categories; curious it certainly is, and a fine work of its class, in spite of its quaint naivete. The Virgin is shown seated in an alcove, with a festoon of natural foliage hanging above, the head is fine and dignified. There are some specimens of Francia and of anonymous painters of his school. The examples of Garofalo (1,481-1,557), a painter whose works are not often seen in loan exhibitions, are of considerable interest, perhaps not the least interesting feature in them is the treatment of the landscapes and distant buildings which form the backgrounds. The "Holy Family," No. 48 in the catalogue, is a fine though very conventional composition of figures posed on a balcony or balustraded terrace, with a hilly landscape and distant buildings behind them. Mazzolino's "Christ Disputing with Doctors" (42) is a remarkable little painting, for its colour, grouping, and the variety of dramatic expression in the heads and attitudes of the disputants. Correggio's "Christ Taking Leave of his Mother before the Crucifixion" (50) is a curious instance of this sentimental painter's utter failure to realise a tragic situation: the figure of the young woman on the right is a very pretty one; there is also an apparent attempt, in the evening sky and twilight landscape, to produce a landscape setting in keeping with the scene. Dosso Dossi's curious and highly-finished painting illustrating the Orlando Furioso, with a naked man wrestling with a man in the foreground, was in the Burlington House Loan Exhibition some years ago, and we are glad to meet with it again. The great work in the collection is Dosso Dossi's grand painting of "Vertumnus and Pomona," a work which, both in composition and colour, makes one think of Titian. Among the drawings on the screens is a beautiful one by Francia, an antique sacrifice, more interesting than any of his paintings that are in the room.

THE water-colour exhibition of the Dudley Gallery Art Society is a much better one than usual. Among others, a lady member, Miss Rose Douglas, deals exceedingly well with architectural subjects, "Venice from the Lido" (192), "The Tower Bridge" (238), "The Lamb Inn, Bathaston" (284). Among the more noticeable works in landscape are Mr. Bruhl's "Bullingham on the Wye" (10); Mr. Hayes's "Berkshire Downs" (88); Miss Margaret Bernard's "Etigny-Vernon" (170) and "Port-sur-Yonne" (196), two admirable examples of sketching in a broad style; also the same lady's "Bawdsey Village, Suffolk" (218); Mr. G. Marks's "Evening Glow" (266); Mr. Donne's "Glacier de Vinbez" (259), a large work which conveys an impression of reality and of careful study on the spot; and the same artist's "On Shere Heath" (293). Signor Giampietri gives a fine study of antique fragments of architecture and sculpture in "Roman Memories" (92: the figures do not improve it), and a "View in the Roman Forum" (320), treated with his usual mastery of architectural detail. Architectural subjects are pretty numerous in the exhibition. Mr. F. Burgess paints "Lambeth Palace" (3); Miss Anne Pedder a "View of the Roman Bath at Bath" (5); Mr. May "The City of Florence," in a large but rather hard drawing (36); Mr. Finn "The Quadrange, Eton College" (156); Mrs. Hartshorne gives us "Emanuel Hospital" and "An Old House in Chelsea" (296-7), both good drawings. A convenient innovation in the catalogue is the interleaving

of decorative design in jewellery are exactly the same as those of architectural ornament—it is only applying the same considerations to work on a smaller scale and in different materials; and that architects both in ancient and modern times (Burgess, for instance) have been among the best designers of jewellery

of copies for the press with blank pages for memoranda.

AMONG the smaller exhibitions now open, the collection of small paintings from Cairo by Mr. Mortimer Menpes, at Messrs. Dowdeswells, contains some very remarkable studies in colour and method of execution, though a good deal of the colour is very much exaggerated and the effects somewhat sensational. For all that, Mr. Menpes always manages to harmonise even his very strong colour effects, and he has developed a method of his own of painting dark shadow with objects half revealed in it which is very powerful and effective. Among the more restrained and sober, and to our thinking more truthful studies are Nos. 3, 4, 15, 18, and 28, which are all admirable as effects of local colour under strong sunlight. Mr. Boughton's watercolour drawings in illustration of "Rip Van Winkle" and the "Legend of Sleepy Hollow," at the Fine Art Society's Gallery, lose a good deal of their point and effect from not having been hung in the order of the narratives, as they certainly should have been. Some of the Rip Van Winkle series are very good realisations of Irving's fanciful and imaginative tale; the Dutch goblins are very well portrayed, and Mrs. Rip Van Winkle is alarmingly true to life without any exaggeration of character. At Messrs. Goupil's gallery is a small collection of paintings by Troyon, including a large and important one, "La Vallée de la Touques," which however in the higher qualities of art is not equal to two smaller compositions, No. 6, "Sheep on the Downs," and No. 17, "Fisherwoman," a very fine work, in which a single figure is plodding over a bleak moor to the sea; there is a remarkable unity and individuality of character and conception about both these, though we are told the latter, perhaps the best thing in the room, is of very inferior commercial value to most of the others, because—there are no cattle in it, and the popular verdict has settled it that Troyon is a "cattle-painter." Such is popular criticism as expressed through the purse.

WE observe from the last number of the *Institute Journal* that the sum of 200*l.* is required in order to carry out the proposed experiments on the strength of brickwork, and that only a very small portion of this amount is subscribed. The object of the experiments is to determine the strength of brickwork when built, as distinguished from experiments on the crushing strength of single bricks. It is to be hoped that so important a practical work will not be allowed to fail for want of funds to carry it out. Even those architects who are not members of the Institute might, we should imagine, support with their subscriptions an undertaking which is of interest to every architect.

#### THE ANTWERP INTERNATIONAL EXHIBITION.

THE Antwerp International Exhibition was opened early in May, but, as is the case with most such shows, it was far from being ready on the day of its inauguration. Six weeks have now elapsed, and though there is certainly a great improvement many gaps are yet observable. We are, however, now at least able to see if the Exhibition is worth visiting or not, and if the architect visitor in the first place will find anything calling for his special attention there.

Antwerp is, at all times, worth a visit, and if we avail ourselves of the occasion the Exhibition gives us for visiting this old city, and after spending our forenoons over what is worth seeing, consider the Exhibition as a recreative lounge for the afternoon and evening, we ought to be thoroughly satisfied with our visit to Belgium. Antwerp, without its exhibition, is a dull place as soon as sight-seeing is over, and the Exhibition, as a whole, is purely a fair, which in itself is devoid of any serious *raison d'être* or special attraction. Consider the



old city to be the reason of your visit to Antwerp, and be agreeably surprised at the gardens, museum, and minor sights of a fair at your disposal. Otherwise, if it was the Exhibition which enticed you to Belgium, you may suddenly remember that there is a Crystal Palace near London which can also boast of a motley collection of stalls, and you will probably regret your passage money.

The Exhibition, as such, is a farce; as a non-descript fair it certainly has, however, some good points. We again see how tired the trades are of the continued so-called minor "general international" exhibitions, and how the various countries are generally only represented at them by firms who have some special object in view, or who are sure of doing a trade in some cheap novelty. It was most fortunate for the Antwerp executive that there were a number of exhibits from the Chicago Fair ready for re-use. Many a case homeward-bound to Germany will have had a six months' stay at Antwerp, and it is just among the exhibits thus detained that we find the few redeeming points in an otherwise unsatisfactory chaos.

Practically, the only three exhibits of special interest to an architect are the collections sent by the Municipalities of Paris, Leipsic, and Hamburg. These collections are interesting in themselves, and give an excellent picture of the work done in the respective cities. There are also to be found here and there some architectural drawings attached to special trade exhibits, such as that of the Galatz grain stores, but nothing of any importance. An International Art Exhibition, which is being held in connexion with the general exhibition, contains further specimens, but, with one or two exceptions, even these are not representative either of the country or the men who have sent them. The Exhibition buildings themselves are of the poorest kind, and only remarkable for the pretty and inexpensive way some of the ceilings have been treated with colour and drapery. The sole redeeming point outside the actual Exhibition halls is a reproduction of a piece of Old Antwerp, which is as perfect as a model of this kind can be. The visitor may come across some building materials, sanitary exhibits, furniture, and the like; but owing to the indescribable confusion which marks the arrangement of the stalls, and the absence of a good catalogue, it would be impossible to give space to their description, or any comments upon them. Messrs. Hampton's elaborate exhibit representing Hatfield Hall, however, calls for remark. It is the same one that was at Chicago, and we are pleased to see that a very good position has been given it.

To go into details as far as the architectural exhibits are concerned, we would, in the first place, speak of the Paris collection. It consists of a large number of drawings, photographs, maps, models, and books, systematically arranged in some half-dozen rooms. Everything of importance referring to the municipal life of the French capital is represented in this collection, and what is more, in such a way as to be sufficiently instructive for the student and yet not tiring to the layman. Our local authorities can well consider the collection a model one in case they ever have to arrange a similar show, and it is only to be hoped that they will be able to equal it, not only in disposition but in the excellence of the actual exhibits. We practically find the same exhibits which were shown in the Municipal Pavilion at the Paris Exhibition, and to which we devoted a long article in the *Builder* for June 15, 1889. Among things not exhibited on that occasion, or not mentioned, are the series of photographs showing specimens of the various classes of buildings to be found in Paris, and its chief ornaments—i.e., its fountains, monuments, &c. Full plans, elevations, and sections of at least one of every class of hospital in Paris are to be seen in the collection; the workhouses, asylums, and shelters of the capital are treated in the same way, but with additional sets of water-colour sketches illustrating their actual working, and showing the types of patients or waifs, as the case may be, that use these public institutions. The central "disinfecting station" is shown in a drawing; there are some highly-coloured views of the crematorium, with the necessary large-scale drawings explaining the engineering detail in it. The working of the Fire Brigade is shown by maps, photographs, and models of engines, and there are also plans of a fire-station. The series of drawings are completed with some showing a new slaughter-house, and a set by the Prison Department. An extensive library and a reading-room has been found space for in connexion with the collection, and is open for both students and amateurs.

The Hamburg exhibits, which are chiefly in the form of drawings and photographs, occupy the walls of a hall containing the valuable collection of models of Atlantic liners belonging to the Hanse port. They do not, as in the case of the Paris sets, represent all the departments of the municipality, but practically only what we should call the Board of Works, an office with which the name of the engineer-in-chief, Herr Andreas Meyer, has now for so many years been prominently associated. Hence the Hamburg exhibits primarily refer to the road-making, the bridge-building, and the harbour works of the city. These latter are of special interest to architects, owing to the unique way in which the most commonplace structure has always received an appropriate architectural treatment. In connexion with the exhibits referring to Hamburg road-making we find excellent illustrations of lamp-posts, railings, shelters, signboards, and the like. Of the many bridges illustrated, the new one over the Elbe takes the first place. The bridge-heads are in the so-called "Pomeranian" style; the cost of the structure was about 125,000*l.*, and the three chief spans measure 96 metres each. The plans and drawings describing the harbour works are supplemented by some elaborate pen-and-ink representations of the chief warehouses on the quays, the various offices, customs stations, and emigrant shelters. The brickwork throughout shows a uniform "Pomeranian" treatment, and the construction everywhere the same combinations of steel, iron, and vaulting which have been proved to be so dangerous at the large Hamburg warehouse fires of 1892 and 1893. Taken as a whole, the Hamburg collection can be safely classed second to that of the Paris as far as the architectural student is concerned. It is a pity, however, that it is not a more complete one.

Leipsic is well represented with a fine set of perspectives and plans explaining its most prominent municipal buildings. The drawings are not classed according to departments, nor is any attempt made to show the working of any separate section of the municipality. The collection is essentially an architectural exhibit, and we may even say the contribution of an individual artist—i.e., the Leipsic city architect, Herr Hugo Licht. His new museum, his market halls, "Scotland Yard," and slaughter-houses, and his design for a new town hall, are all to be seen at Antwerp, and form a striking example of the power a foreign building official often has to beautify or mar his town. There are few cities where a decade has seen so many new public buildings as Leipsic, and few where the majority are so successfully designed as in this Saxon town. This is the more notable if we remember that a German city architect has even more office routine and red-tapeism to attend to than his English confrère, and that Herr Licht's designs, nevertheless, show so much individuality that the merest amateur will at once recognise his hand in the drawings of any one of them.

We will not refer in detail to the drawings exhibited in connexion with trade exhibits, excepting, perhaps, to mention that even a company in distant Saigon is represented in an odd corner by drawings of the Governor's Palace and other public offices, and that the many iron foundries exhibiting send valuable drawings, such as the design of the railway station at Saragossa and the pier at Blankenberg. The few architectural exhibits in the International Art Show are scarcely more interesting. England is represented only by Mr. T. W. Cutler, who has sent drawings of some interiors, a cottage and a country house. Of some thirty French drawings we came across, M. Albert Ballu's design for the Bureaux Houses of Parliament was the most important. He also exhibited drawings of the Palais de Justice at Charleroi and some of the pavilions he erected at the last Paris Exhibition. M. Deglane and M. Normand sent some excellent classical studies. The most important Belgian exhibit is a model of the new Antwerp Customs House, designed by M. Schadde; the others, as was the case at Brussels Triennial Salon last year, are apparently only sent by students or advertisers. The seniors of the profession have again kept aloof, and to this fact we must also ascribe the poor show made by other countries which might have been ready to contribute if a business-like invitation had been issued by some leading Belgian architects.

Outside the Exhibition Halls, as said above, we find some excellent models of Dutch work, representing "Old Antwerp." The grouping is perfect and the effect obtained by a judicious combination of timber, plaster, paint, and wrought-iron as "natural" as possible. "Old Antwerp" has two main roads called Exchange-

street and Chapel-street, a number of alleys, a fine market-place, and even a miniature common. There is a chapel, a town hall, an Exchange, and an open-air theatre, an old gateway, and more than seventy houses of all classes and periods. It would lead too far to attempt here a description in detail; it will suffice to say that every model has been carefully designed to accord with some historical structure, and hence the whole forms a thoroughly reliable encyclopædia for the student, who will find any particulars he may require in a well-illustrated handbook published by M. E. Lyon-Claessen, of Brussels. For ninety-nine of every hundred visitors Old Antwerp will probably be the *pièce de résistance* at the Exhibition. It is certainly the most pleasing exhibit at this nondescript fair if we except the International Art Show, practically an independent concern, of which we may speak at a later date, when the "hanging" has been completed.

#### THE MEETING OF THE LINCOLN AND NOTTS ARCHITECTURAL SOCIETY AT HORNCASTLE.

THE Lincoln and Nottingham Architectural Society held their annual gathering on the 6th and 7th inst. at Horncastle. The attendance was good, the weather fine, and though the churches visited were, on the whole, not of the first order of excellence, and too many of them had suffered from long neglect in past years, and too drastic restoration in the last half-century, none of them were without interest. The director of the excursions and organiser of the meeting generally was the Rev. J. Conway Walter, of Langton. The description of the churches, formerly undertaken by the late much-lamented Bishop Trollope, was given by Precentor Venables. As is too often the case in these excursions, too much was included in the scheme, and though it was found necessary to omit several places marked out for a visit, the time allotted to each was insufficient for more than a brief examination. Just as one was beginning to make out the plan and history of the church, the bugle sounded, and the cavalcade was once more in motion, leaving it half seen. On another occasion we should recommend attempting less, and seeing it more thoroughly.

The part of Lincolnshire visited was the Wold district lying to the south-west of Lincoln, between Horncastle, Alford, and Spilsby. The steep hills and wide views over the chalk and greensand ranges were a complete corrective to the ordinary idea of the county as "all fogs, and fens, and flats." The county, though too bare of wood, is decidedly attractive, and the little villages, often lying in a quiet scoop of the wolds, with their thatched cottages and gay gardens, clustering round the grey, low-towered church, such as no land but England can show, were charming. But as we have already said, this district of Lincolnshire, in spite of some notable exceptions, such as Bolingbroke and Tattershall, is not rich in church architecture. While no county in England can show finer churches, few counties contain a larger proportion of poor ones. This is especially true of the Wold district, where the excursions lay. Originally, for the most part small edifices, with no sumptuousness of detail, bespeaking a poor and sparse population, in no part of England probably had they been allowed to fall into a more miserable state of decay and squalor during the last dreary century. A collection of drawings taken by Sir Joseph Banks in 1790, by a French artist, of all the churches of Lincolnshire, recovered by the late Mr. Edward Stanhope, and now preserved at Revesby, shows that they were at that time mostly dilapidated, deprived of almost all architectural features, the windows blocked or replaced by square-headed openings with wooden casements, chancels and aisles pulled down and the arches built up, the roofs lowered, and the crumbling walls patched with brick, while not a few had lost all ecclesiastical semblance, and were reduced to mere thatched hovels, with a tottering pigeon-cot for the bell, though even that was sometimes wanting. The attempts at repair had, architecturally speaking, only made bad worse, and while probably rendering the buildings weatherlight, and making the decencies of public worship not quite hopeless, had made sore havoc of all features of antiquity. Some of the churches having sunk too low to be capable of repair had been taken down and replaced by small square rooms, often without a pretence at a chancel, with round-headed windows, and a mean little bell-cot



at the west end. Very few specimens of the former state of things now remain. The two Marehams—"On the Hill" and "le-Fen"; Wilksby, an entirely useless red brick church, or rather hovel, which we hope may soon cease to disfigure the landscape; Bag-Enderby, a small and grievously mutilated church, with a curiously carved font and many capabilities, the tower, having its date 1407, and the name of its builder, Alwin, of Enderby, given by his memorial slab; the very curious church of East Kirkby, one of the most interesting and most grievously patched and dilapidated of those visited, full of curious things; and a few others, still exist to illustrate the former state of things. Throughout the district "restoration" has been busy, and though, necessarily, some mischief has been done, and the churches have lost their ancient look, and been smoothed down into uninteresting decency, yet the mischief is less than in some other parts, leaving less to lament and more to condone. The chief restorer has been the late Mr. James Fowler, of Louth, of whose work the church of South Ormesby is a very creditable example. This church was one of the best visited. Standing on a green, sloping hillside in a well-timbered park, the pinnacles of its Perpendicular tower, and the double gables of its Decorated chancel and chantry, overlooking the cottages of the little village below, with the red-brick Hall and shining lake hard by, combine to form a charming picture of English manorial life as it once was, before the ruin of agriculture and the fall of rents had made absenteeism so common. Mr. James Fowler was also the builder of the new church of Moorby. It was an early work of his, Mr. Banks Stanhope bearing the cost. The walls are banded in red brick and green sandstone, not with a happy effect, and there is a miserably attenuated turret and spirelet at the north-west corner. Mr. Fowler lived to do much better work.

The new church at Revesby, replacing a miserable building of the meeting-house type, is a very pleasing work in the Late Decorated style, by an architect of the same name, Mr. C. Hodgson Fowler, of Durham. This also is due to the generosity of Mr. Banks Stanhope, and of his late relative, Mr. Edward Stanhope. It has a north aisle, with a well-proportioned arcade, well developed chancel, and a western tower and spire. The windows are Decorated; those of the chancel of the Flamboyant type. Though in some respects open to criticism—e.g., the chancel suffers in outline by the gabled corner buttresses being kept too low—Revesby Church affords an encouraging example of the power of a modern architect to throw himself into the spirit of Medieval work, without any servile copying. Under the tower and in the vestry are preserved fragments of carved work from the ancient Cistercian Abbey Church, discovered in the walls of the lately-demolished edifice, which make one sigh over the evident architectural glories of that building. The encaustic tiles of the sanctuary, of singular beauty and unusual design, are copies of those which once decorated the floor of the Cistercian Abbey.

At New Bolingbroke we have another example of Mr. James Fowler's skill as a restorer. It was one of his latest works, and certainly one of his best. The existing church is only the south aisle of a much larger church, probably erected by John of Gaunt, on his becoming possessed of the manor by his marriage to his cousin Blanche, of Lancaster. If the destroyed nave, north aisle, and chancel corresponded in style and dimensions with the portion that remains, it must have been a very fine church, admirable both in design and execution. The small portion surviving is well worth a visit as an almost faultless example of Late Decorated at its best. The north arcade, which had been built up on the destruction of the nave, has been opened out, and a small north aisle erected corresponding in style. The four arches of the arcade are full and well proportioned, the mouldings being continuous, without capitals. In the south porch is a canopied stoup of unusual size and richness, and in the chancel is a range of sedilia with groined canopies, rich, but heavy. Traces of demolished statue niches are seen on either side of the east window. The tower at the west end of the new north aisle is a sturdy square Perpendicular building, later than the existing church, and hardly worthy of it.

Of the famous historic Castle of Bolingbroke, the birthplace of Henry IV., from which he took his title, little but the site remains. The irregular arch, protected by a moat and earthworks, shows only rough, grassy mounds, with here and there a bit of walling peeping out; the spade and

pickaxe are required to develop its original plan, an interesting but laborious work, which the "Duchy" might well undertake. May we commend it to the attention of the new Chancellor, Lord Tweedmouth?

The excursion practically ended with the fine church of Coningsby and the grand castle and church of Tattershall; both of these latter are of the same age, the work of the same founder, and each first-rate examples of their respective class. Coningsby, the victim of an unhappy restoration some years back, which ruined the stately range of lancets in the clearstory, and added a frippery apsidal chancel—

"Desinit in piscem mulier formosa superne,"

is still a fine church, chiefly Early English. The chief feature is the Perpendicular western tower, standing on open arches to the north and south, and with traceried circles to the east and west. The stonework is excellent, and the large amount of unbroken wall adds much to its quiet dignity.

Coningsby is only separated by a stretch of green meadows from the very remarkable buildings at Tattershall, with which its tall grey tower groups admirably. The church and castle of Tattershall were both built by Lord Cromwell, Treasurer of Henry VI., who died in 1455, before either of them was finished. In the completion of the church William of Waynflete, the founder of Magdalen College, Oxford, was concerned. His arms appear on the porch, and some points of similarity between the two buildings may be traced. It is rare to find two contemporaneous buildings close together, each so complete in its style, and each so free from all admixture of architecture of earlier date. The cruciform church, founded for a provost and collegiate body, is well known as one of the noblest examples of Perpendicular in its purest form. Erected at one effort, it consists of a stately nave of six lofty arches rising from slender-shafted piers, with bases raised high above its floor, with clearstory windows in pairs above each arch, and a low-pitched roof, now in very bad repair, and requiring early attention.

The tower opens into the nave by a noble belfry arch with continuous mouldings. Great dignity is given to the church by the elevation of the nave being continued through the transepts and chancel, the side windows of the latter being the whole height of the lofty walls. The tracery of the windows, though rigid and formal, is excellent for its style. When filled with stained glass, which was only removed in 1757 (having been unwarrantably made a gift of by the Lord Fortescue to the Earl of Exeter for the decoration of St. Martin's, Stamford, the greater part having been lost or smashed in the transit), the effect must have been one of surprising magnificence. Its chancel is the only part of the church used for services, and is divided by a stone road-loft from the nave, the effect of which is much enhanced by its area being left entirely unencumbered by seating, the only piece of furniture being a dilapidated pulpit on a fine carved base. A magnificent but sorely-mutilated series of brasses is collected in the north transept, prudently kept inaccessible to any but privileged visitors. The greatly-needed restoration has been placed in the hands of Messrs. Bodley & Garner, but the cost will be enormous, and the resources of the parish are entirely unequal to the work.

Tattershall Castle is too well known to need description even if our space allowed it. Built about the same time as Hurstmonceux in Sussex, it presents likewise a magnificent example of Medieval brickwork, with stone dressings. Though built not so much for defence as for baronial grandeur it preserves the old outline, which is distinctly that of a Norman keep. The entrances are all on one side, defended by machicolations in the topmost parapet. It is doubtful whether the castle was ever completed, or whether the building was arrested by the death of Lord Cromwell. Within, each of the four stories contains a large central chamber, with huge fireplaces, richly sculptured with armorial bearings. The upper corridors are being of the same material. Every detail of the few buildings of the date will better reward careful examination. In common with the castles generally throughout England, Tattershall was "slighted," i.e., gutted and rendered indefensible by order of Parliament during the Commonwealth, but it was so well built and the material so imperishable that, though roofless, it continues in an excellent state of repair.

Of the other places visited we may mention that Somersby, Lord Tennyson's birthplace, has

an almost unique example of a churchyard cross, with tapering stem and gabled tabernacle, exhibiting the Passion on one side and the Virgin and Child on the other, in excellent preservation.

The interest of the little church has been restored away. Its low square tower has been made still lower by decapitation; green sandstone wastes rapidly, and the belfry stories having become unsafe they were taken down to save the cost of repairs. The church of Scirelshy, the home and burial place of the Dymockes Champions of England, presents a singular example of the addition of a short Perpendicular chancel at the end of one of Early English date. The original chancel arch has been taken down and the piscina removed to its corresponding place in the later wall. The church has suffered grievously from a drastic restoration, which has only spared the arcades.

To sum up, the churches visited were generally plain buildings of the thirteenth century, the arcades being chiefly of that style. Of Decorated the best specimens were the naves of Horncastle, a spacious and well-proportioned town church, but with no special points of interest, and largely restored, and of East Kirkby, where the over-tall piers push the arches up too high; and the chancel of Haltham, which has a large and rather coarsely-worked east window of flowing tracery, too big for the gable end in which it is set, a couple of low side windows, and a curious little corner piscina set in the angle of a window-jamb, a little column supporting the two arched openings at right angles to one another. As is commonly the case, most of the churches had some Perpendicular windows, and Horncastle a Perpendicular clerestory, but the only complete church of the style was the magnificent example at Tattershall of which we have already spoken.

The towers, of every style, are universally low and square, and generally destitute of pinnacles. There is some screen work at East Kirkby, Scirelshy, and Haltham, and at the first-named church a curious small Easter sepulchre, showing a recess with carved back, containing kneeling figures of the three Marys carrying their caskets of spices, and a piscina with drain projecting from its base.

#### THE ROYAL INSTITUTE OF BRITISH ARCHITECTS.

At the business general meeting of the Royal Institute of British Architects on the 11th inst., after the scrutineers' report on the election of the President and Council for the year of office 1894-95 had been read (we quote from the *Journal* of the Institute), Mr. Charles Barry, F.S.A., Past President, moved, and Mr. John Slater seconded, a vote of thanks to the retiring President, Mr. J. Macvicar Anderson, who, in accordance with rule, remained in the chair until the close of the meeting.

Mr. Barry spoke of the extreme value of the services that Mr. Anderson had rendered during the three years, not altogether uneventful, which he had served as President of the Institute—three years which had included within their scope questions of no little interest to the profession of architects as well as to the status of the Institute. Mr. Anderson, in his position, and with the dignity of his position, and with that geniality, ability, and courtesy for which he was unmistakably distinguished, had been enabled to render them very large services indeed. He had occupied the chair with absolute distinction, and he had bequeathed to his successor, Mr. Penrose, a burden and a responsibility which were not light.

Mr. John Slater, in seconding the vote, endorsed Mr. Barry's remarks, and referred to the immense debt which the Institute owed to the outgoing President, Mr. Anderson, who, not alone in the chair of the Institute, but in that of the Council, had presided with an urbanity and with a sense of justice that could not be too highly praised. It was no easy task for any President to follow in the steps of their previous President, Mr. Waterhouse, and it appeared to him (the speaker) to be one of the greatest signs of Mr. Anderson's ability, suavity, and general fitness for the Presidency of the Institute that he had been no unworthy successor of Mr. Alfred Waterhouse.

Mr. Macvicar Anderson, acknowledging the vote, passed with the utmost enthusiasm, said that the words used by Mr. Barry and Mr. Slater had been not merely complimentary, but so far beyond what the occasion required that it became difficult to reply to them. He might say, however, that his connexion with the Institute had



not been one of yesterday. He could recall many years of arduous, very agreeable, and pleasant work in various posts he had occupied by their courtesy. When, three years ago, they in their goodness thought fit to elect him to the position which he had always looked upon as the highest honour that one could rise to in the profession, he remembered saying that he trusted, even coming after so distinguished a predecessor as Mr. Alfred Waterhouse, to be able to hand down the traditions of the Institute without sullying or tarnishing their glory; and he could honestly say that neither time, thought, nor study had been spared in trying to do so to the best of his ability. He would fain hope that those efforts, small as they had been, had resulted in maintaining the dignity of the Chair, in furthering the prosperity of the Institute and the welfare of the profession. He thanked them most heartily for what had rendered his task at all times a comparatively easy one—the great kindness and consideration that they had extended towards him. It was, of course, absurd to expect that a body averaging twenty men on the Council, and averaging considerably more in general meeting, should always be of the same opinion, nor was it desirable that they should be; and sometimes it had been a little difficult to steer an even course between divided opinions. He could only hope that in endeavouring to do so—to be firm and at the same time impartial—he had not been so unhappy as to arouse ill-will on the part of any one.

At the close of the meeting, the ex-President handed the badge of office to his successor, Mr. Penrose, who, as Mr. Slater had previously stated, had been elected a Fellow of the Royal Society on the 7th inst. The ex-President in so doing repeated that if anything could afford him more gratification than another, it was the circumstance that he was succeeded by one so eminent, so able, and so distinguished in every respect, as Mr. Penrose.

The arrangements for the dinner to take place on the 2nd prox., at the Whitehall Rooms, in commemoration of the first general meeting of the Institute, held on July 2, 1834, at the old Tatched House Tavern, are progressing. The chair will be occupied by Mr. Francis C. Penrose, F.R.S., President, and he will be supported by most of the Royal Gold Medalists, some Honorary Fellows, and several distinguished guests representative of Literature, Science, and Art. The Church, the City and Metropolis, Parliament, Official Departments, and Corporate Bodies in correspondence with the Institute will be represented at the dinner.

### THE LONDON COUNTY COUNCIL.

The usual weekly meeting of the London County Council was held on Tuesday at the County Hall, Spring-gardens, Sir John Hutton, Chairman, presiding.

**Jobbing Works.**—The General Purpose Committee reported as follows:—

"We have had under consideration a suggestion from the Works Committee that, with a view to defining what work should be considered as jobbing works, a standing order should be made to the effect that all works of an estimated cost of not exceeding 100*l.*, and all works for which complete specifications, drawings, and bills of quantities are not supplied, should be considered as jobbing works, and that the Works Committee should be authorised to render the accounts as such. While concurring in the view that there should be some definition of what work should come within the category of jobbing works, we see considerable difficulty in the way of fixing a money limit. There was a clause in the former jobbing contracts under which the Council could require the contractor to carry out work and to supply materials for the same, although the estimated cost of such work and materials exceeded 100*l.* The Engineer and the Architect both inform us that they have often occasion to execute work which cannot very well be estimated or measured until it is opened out—as, for instance, the repair of a sewer or similar underground work. Works of this nature often cost more than the 100*l.* limit suggested, and if such a limit were adopted it would be difficult to know how to deal with works the cost of which might roughly be estimated at over the 100*l.* or any other limit adopted. In these circumstances we have come to the conclusion that the money limit should be excluded from the definition, and that jobbing works should be defined as works for which bills of quantities are not necessary, complete specifications and drawings are not supplied. We are also of opinion that a schedule of prices should be prepared, upon which, in respect of jobbing works, the estimates, measurements, and certificates of the engineer or architect would be

based for the information of the committees ordering the work, and that the schedule should be revised periodically. This schedule would afford a means of comparing the cost of work done by the Works department with that executed under ordinary contract; such a comparison would, we think, be a desirable end to keep in view. We have also considered in what form the accounts for jobbing works should be rendered, and the form of account we have prepared will show (a) the certificate of the head of the department as to the completion of the work to his satisfaction and as to the estimated cost of the work on the agreed schedule of prices according to details annexed, and (b) the amount to be charged to the Committee ordering the work, which will be the actual cost of the work, comprising the following particulars:—(1) wages, (2) materials, (3) use and waste of plant, and (4) establishment charges at a percentage to be from time to time agreed upon. To give the details of the estimated cost of the work under the agreed schedule of prices would entail upon the Works department additional expenditure for assistants. As the information would be for the purpose of enabling heads of departments to report to the committees ordering the work what the cost of the work would have been on the agreed schedule of prices, we think it would be only fair that this expenditure, which is in excess of that required for the audit, should to a certain extent be defrayed out of the general establishment expenses of the Council. We recommend—

- (a) That the Council do make a standing order as follows:—All works referred to the Works department to carry out, for which bills of quantities and, where necessary, complete specifications and drawings are not supplied, shall be considered as jobbing works.
- (b) That the schedule of prices be agreed upon between the Works department and the Architect and Engineer, upon which, in respect of jobbing works, the estimates, measurements, and certificates of the Architect and Engineer shall be based, and that the schedule be revised periodically.
- (c) That the accounts of the Works department be rendered in accordance with the form described in the report.
- (d) That in order to cover the extra cost to be incurred by the Works department in supplying the details of the estimates, measurements, and drawings, and under the agreed schedule of prices, a contribution be made to the Works department out of the general establishment expenses, such amount to be agreed upon at the end of the current financial year in connexion with other financial adjustments with the Works department which will then have to be made.

To save time we have instructed the Engineer and the Architect to confer with the manager of the Works department with a view to the preparation of a schedule of prices.

Mr. Emden moved that the recommendations be referred back, since it had been shown that the Works Committee could not carry out jobbing work as economically as the jobbing contractor. In the case of jobbing works done by the Public Health, Main Drainage, and Bridges Committees, they had cost more when carried out by the Works Committee than by a contractor.

Major Probyn seconded.

Mr. Ward, Chairman of the Works Committee, said that during the last twelve months the Works Committee had done about 30,000*l.* worth of jobbing work, and there had been no complaint as to the cost except in one or two items. If they took the whole of the jobs it would be found that there was a profit of 10 per cent., and the few cases where the estimated cost had been exceeded did not justify the conclusion that the jobbing work by the Works Committee had been a failure.

Mr. Goodman, to show that, taken as a whole, the work done by the Committee had been a great success, mentioned that two sewers were recently constructed, one by a contractor, the other by the Committee, and that on the first there was a bill for extras amounting to 1,700*l.*, while on the other there was a saving of 3,000*l.*

The amendment having been negatived, the recommendations of the Committee were agreed to.

**Blackwall Tunnel Works.**—The Bridges Committee reported that the estimated total value of the work done at the Blackwall Tunnel up to the 31st ult. was 299,377*l.*, and of this the sum of 7,023*l.* was due to operations relating to the raised approach. The expenditure of 14,863*l.* represented the progress made during the month.

**Proposed Asylum.**—The Asylums Committee reported that the purchase of the portion of Baldwin's Estate, Bexley, Kent, as a site for a new asylum, was completed on April 10 last. They proposed, in accordance with the powers conferred by section 254 of the Lunacy Act, 1890, to obtain by public advertisement plans and estimates for the erection of an asylum for 2,000 patients, and to duly submit, for the approval of the Council, the design selected.

**Parker-street Lodging-house.**—Alderman Fleming Williams, replying to Mr. John Burns, said he had not seen a statement in the papers to the effect that the Parker-street Lodging-house was built by the Works Committee, and cost 22,000*l.*, the amount of the estimate having been 11,000*l.* As a fact it was built by a contractor, and not by the Works Committee.

**Sanitary Condition of London Bakehouses.**—The report of the Public Health Committee on the question of the sanitary condition of London bakehouses was submitted by Alderman Fleming Williams, and was to the following effect:—

"The medical officer under our instructions has submitted to us a report on the sanitary condition of bakehouses in London. As the report contains valuable information on this important question, we have had it printed and a copy sent to each member of the Council. It will be seen that the existing law with reference to the sanitary condition of retail bakehouses in London may be considered under two headings, viz.—(1) *Internal*, and (2) *External*. The Factory and Workshop Act, 1878, section 34, provides that the inside walls of every bakehouse shall either be painted or varnished or be limewashed. If paint or varnish be used, it must be renewed every seven years, and be cleansed every six months; limewashing must be renewed every six months. Section 35 prohibits the use as a sleeping place of any place on the same level as the bakehouse, and forming part of the same building, unless it be effectually separated from the bakehouse and have access to external ventilation. The Factory and Workshop Act, 1873, the provisions contained in Section 15 of this Act apply only to bakehouses newly occupied after June 1, 1873. Section 15 provides that—(i) No water-closet shall be within or communicate directly with the bakehouse; (ii) The cistern supplying water to the bakehouse shall be distinct from the cistern supplying a water-closet; (iii) No drain or pipe carrying off faecal or sewage matter shall have an opening within the bakehouse. Section 16 authorises a court of summary jurisdiction to impose a fine not exceeding forty shillings if satisfied that any room or place used as a bakehouse (whether the same was or was not so used before the passing of this Act) is in such a state as to be on sanitary grounds unfit for use. The Public Health (London) Act, 1891, section 26, enacts that the above sections in the Factory and Workshop Acts shall be enforced by the sanitary authority of the district in which the bakehouse is situated. (b) *Enactments applicable to bakehouses in common with other workshops.*

Being a workshop, is subject to the provisions of the Public Health (London) Act, 1891, relating to such premises. Section 2 (1) (g) provides that any workshop—(i) not kept in a cleanly state and free from effluvia arising from any drain, privy, earth-closet, water-closet, urinal, or other nuisance;—(ii) not properly ventilated;—(iii) so overcrowded during working time as to be injurious or dangerous to the workers—shall be a nuisance liable to be dealt with summarily under the Act. Section 38 requires that every workshop shall be provided with sufficient and suitable accommodation in the way of sanitary conveniences. The Council has power to take action if a sanitary authority make default in carrying out the provisions of the Public Health (London) Act, 1891, or of sections 15 and 16 of the Factory and Workshop Act, 1873, with regard to bakehouses. The report gives the result of the inspection made by Dr. Haime and Dr. Young, the Council's assistant medical officers of health, of about 200 bakehouses in London, 118 of which were situated wholly or partially below the ground level. As regards ventilation, it was found during the inspection that in 28 bakehouses the provision for this purpose was quite insufficient, and with four exceptions these were all underground bakehouses. In several cases the lighting of underground bakehouses was also quite inadequate. Many bakehouses were found to be in a dirty condition, this being due in some cases to a disregard of cleanliness in the conduct of the business, and was most marked in bakehouses where confectionery was also made; in others this was due to insufficient limewashing and cleansing of the walls. The paving in some cases was also uneven or defective, and entirely absent underneath the floor trough. Water-closets were found within or communicating directly with the bakehouse in four cases, and thirty-seven bakeries were found to have an inlet not aerally disconnected from the drains. There was no evidence of overcrowding. The statistics contained in the report raise some suspicion that the occupation of a baker is attended with certain dangers to health, but the statistics collected do not deal with a very large number of deaths. We are satisfied from the evidence obtained that it is very desirable that the provisions of the law with reference to bakehouses should be enforced. We think that the Council should be empowered to charge of the bakehouses of London, and that the Council should be empowered to make regulations which might deal with the following points, viz.—(1) The position and structure of workshops and workplaces used as bakehouses, and of rooms



or places used in connexion therewith. (2) The lighting, ventilation (including air-space) cleansing, drainage, and water supply of such premises. (3) The provision and situation of water-closets and urinals in connexion with bakehouses. (4) The prohibition of the use of the bakehouses for other purposes than the preparation of food. (5) The use of any room adjoining or opening into any bakehouse. (6) The conduct of the business and the prevention of the contamination upon the premises of any articles of food prepared in any bakehouse or of any materials to be used in the preparation of food. (7) The mode of making application for licence to use any premises as a bakehouse. We also consider that—(a) No premises should be used as bakehouses which are not licensed by the Council, and that a licence should be operative for a period of five years. Power being however given to the Council to suspend any licence for contravention of the regulations. (b) That all bakehouses which are occupied for the first time after these regulations come into force should before such bakehouses are occupied, be made to comply with all the regulations. (c) That bakehouses which are occupied before the by-laws come into force should be exempt for a period of five years from the regulations as far as these will require structural alterations other than those now required under existing law, but that after this period they should be required to comply with all the regulations. We may point out that the Government has introduced a Bill for amending the Factory and Workshop Acts, and this seems to afford an opportunity for amending the law relating to bakehouses.

We recommend—

That the Council do endorse the views expressed in this report, and give instructions for a copy of this report and of the medical officer's report to be sent to the President of the Local Government Board, with a request that he will take steps to obtain an amendment of the law relating to bakehouses in the manner here proposed.

The consideration of the report was adjourned for a week.

The Council adjourned at twenty minutes past eight.

## Illustrations.

### PLANS OF CHRIST'S HOSPITAL SCHOOLS.

WE give this week the large general plan of Messrs. Webb and Bell's design for the new Christ's Hospital Schools at Horsham, which has been selected for execution; the plan and end elevation of the central hall and its adjoining class-rooms, and the plans of one of the boarding-houses.

We noticed the principal points evidently aimed at in the planning, in the general review of the designs in our last issue, and the architects entirely confirm the accuracy of our general exposition of the leading ideas of their plan. The only points on which we need add a word are as to the ventilation of the dormitories, and subterranean passage shown in the basement plan of the boarding-house. The ventilation of the dormitories is effected by means of flues in the walls connected by trunks in the roof to a ventilator on the ridge containing a small steam coil. The ventilators are placed on the annexes in order to avoid the possibility of the air from the annexes being drawn into the wards, the current being the other way.

The servants' subway is necessary because the servants from each house have to make their way to the central dining-hall several times a day in all weathers. The suggestion arose from this of a covered way for the boys above ground, connecting the boarding-houses with the dining-hall, so that both boys and servants can reach it under cover, but by entirely separated corridors.

We may add here the architects' statement of the reasoning which led them to the adoption of the principle of planning carried out in their design, extracted from the draft report which they have kindly sent us:—

"In dealing with such a problem as the one now before us, one's first impulse is towards a reproduction, with modifications, of the traditional type of our university towns. The leading features of our great Medieval seats of learning are familiar to all. The well-guarded entrance gateway for security and discipline, the enclosed 'quad' with hall and chapel, master's house, cloistered walks and students' rooms, with further similar 'quads' beyond, round which are ranged libraries, museums, and such like—these present a complete embodiment of the requirements of a great school, all in proper order and due sequence. For security and control, for convenience of daily work and for economy of administration, the Medieval plan does not admit of improvement. But investigations into the conditions of healthy life show that this time-honoured arrangement, as sketched above, has one defect. It is insanitary.

The enclosed 'quad' with its four dead angles, makes for the partial exclusion of sunlight and the stagnation of air; whereas an abundance of sunlight and the free movement of air about and around a building, are now universally regarded as amongst the first requisites of health. So that the ideal arrangement from a sanitary point of view—and sanitary considerations must rule in this case—is not to be sought in the compactness and concentration of the Medieval plan, but rather in its opposite, dispersion and segregation. If, however, this principle be pushed to extremes, the result would be, in the case of so large an establishment as Christ's Hospital, a practically unworkable plan. The true solution appears to lie in a division of the scheme into two sections, the residential portion and the working portion, and to treat each portion on its merits.

Accordingly, in the plan now submitted, the residential portion has been extended along a southern frontage, the blocks separated by ample interspaces, and the working portion has been gathered up in the centre and disposed about a cloistered 'quad,' where the hall, chapel, and schools are, with sufficient intervals between each, placed.

By this arrangement something of the architectural effect of the Medieval treatment is retained, and with it the scholastic stamp. The working portion of the hospital is brought to a focus, and the time of the working-day is economised, whilst the residential portion is dispersed."

### SCULPTURE AT THE ROYAL ACADEMY.

THE two circular bas-reliefs by Mr. F. E. E. Schenck, which are in the Lecture-room at the Royal Academy, and are illustrated in this number, require no description beyond the hints furnished by the quotations appended to them in the catalogue, and printed under the titles on our plates. The lines appended to the figure representing Night are from Joanna Baillie, the others from Byron.

The bas-reliefs, which are of very fine sculptural character, are, at present, in plaster only. It is to be hoped the sculptor will be commissioned to give them more permanent form in marble.

### LONDON AND MIDDLESEX ARCHÆOLOGICAL SOCIETY.

A CONVERSAZIONE of this Society was held on the 12th inst., at the Innholders' Hall, College-street, Dowgate-hill, by permission of the Master, Wardens, and Court of Assistants of the Innholders' Company. Dr. Edwin Freshfield, President of the Society, was in the chair, and opened the proceedings by calling attention to the many beautiful objects of interest exhibited to the meeting, among them being some photographs of the crypt of St. Laurence Pountney, recently destroyed. This crypt was illustrated and described in a letter by Mr. W. H. Nash, in the *Builder* of April 28 last. Dr. Freshfield greatly deplored this destruction, and said it seemed as though they must destroy everything that was old in the City of London. The churches were also being destroyed, and it seemed as though St. Ethelburga's, Bishopsgate-street, was doomed. He hoped they would all do their best to prevent such vandalism from taking place. Some people asked, what did it matter if they had union of benefices provided it was stipulated the churches should be preserved. But he would have them remember what had occurred in the past. The same sort of thing was said about St. Antholin's, which was removed all the same.

Mr. J. Douglass Mathews then read a paper on "Historical Notices of the Worshipful Company of Innholders, with Remarks on their Hall and Pictures." The first reference that he found relating to a Society of Innholders was contained in the "Memorials of London Life, and was a petition from the hostelries of London to the Mayor and Aldermen in the first year of King Edward III.'s reign in 1327. In 1473 a petition was presented to the Lord Mayor praying that the craft be called "Innholders" instead of "Hostlers." In 1509 an application was made for a charter, and in 1514 King Henry VIII. granted a patent or licence, which was exhibited to the meeting. A second charter was granted by Charles II. in 1663 reciting the charter of Henry VIII. In February, 1685, another charter was granted on the surrender of that of Charles II. A grant of arms was made in 1634. There appeared to be no particulars of the Company's hall prior to the Great Fire of London, except that it was on the site of the

present hall, and that in 1659 the Master and Wardens were directed to view the cellar under the hall, and see what defaults were in the reparation. The first entry in the minutes after the Fire relating to the Hall was September 10, 1667, when a draft of the building to be made was ordered, and a fortnight after the Master and Wardens were directed to inspect the ground of the Hall and report. In January, 1668, it was ordered that the ground or site should be cleared, and the foundations laid. There appeared to have been no contract, but the several tradesmen were employed and paid from time to time by instalments a total sum of 1,202l. 18s. In 1842 a sum of 700l. was expended. It was satisfactory to note that the present generation were not altogether to blame for builders' extras, as in each case the total cost was very far in excess of the original estimate. The Hall was again restored in 1882, but fortunately without greatly interfering with its effect, which really remained the same to-day as it did 200 years ago. According to the minutes, in former times, their wives frequently sat down to dine with the members.

Mr. Philip Norman, F.S.A., next read a paper on "Famous London Inns," and called attention to a large collection of engravings and drawings exhibited on the platform, all collected or drawn by himself. There were drawings of "The Tabard," "White Hart," "George Inn," "King's Head," &c. in Southwark, "The Paul Pindar" (now in South Kensington Museum), the "Old Cheshire Cheese," Fleet-street, and many other ancient hostleries of London which he described.

Mr. S. Hope next described the seals, and Mr. E. H. Freshfield the plate, which were exhibited.

After the votes of thanks to the several speakers, and to the Innholders' Company, and chairman, the meeting, which was very numerously attended, proceeded to inspect the various objects of interest displayed.

### COMPETITIONS.

CRICKET PAVILION, BEDFORD.—The result of the competition for a cricket pavilion at Bedford has just been made known. The successful competitor was Mr. A. E. Kirk, A.R.I.B.A., of 13, Bond-street, Leeds.

## Correspondence.

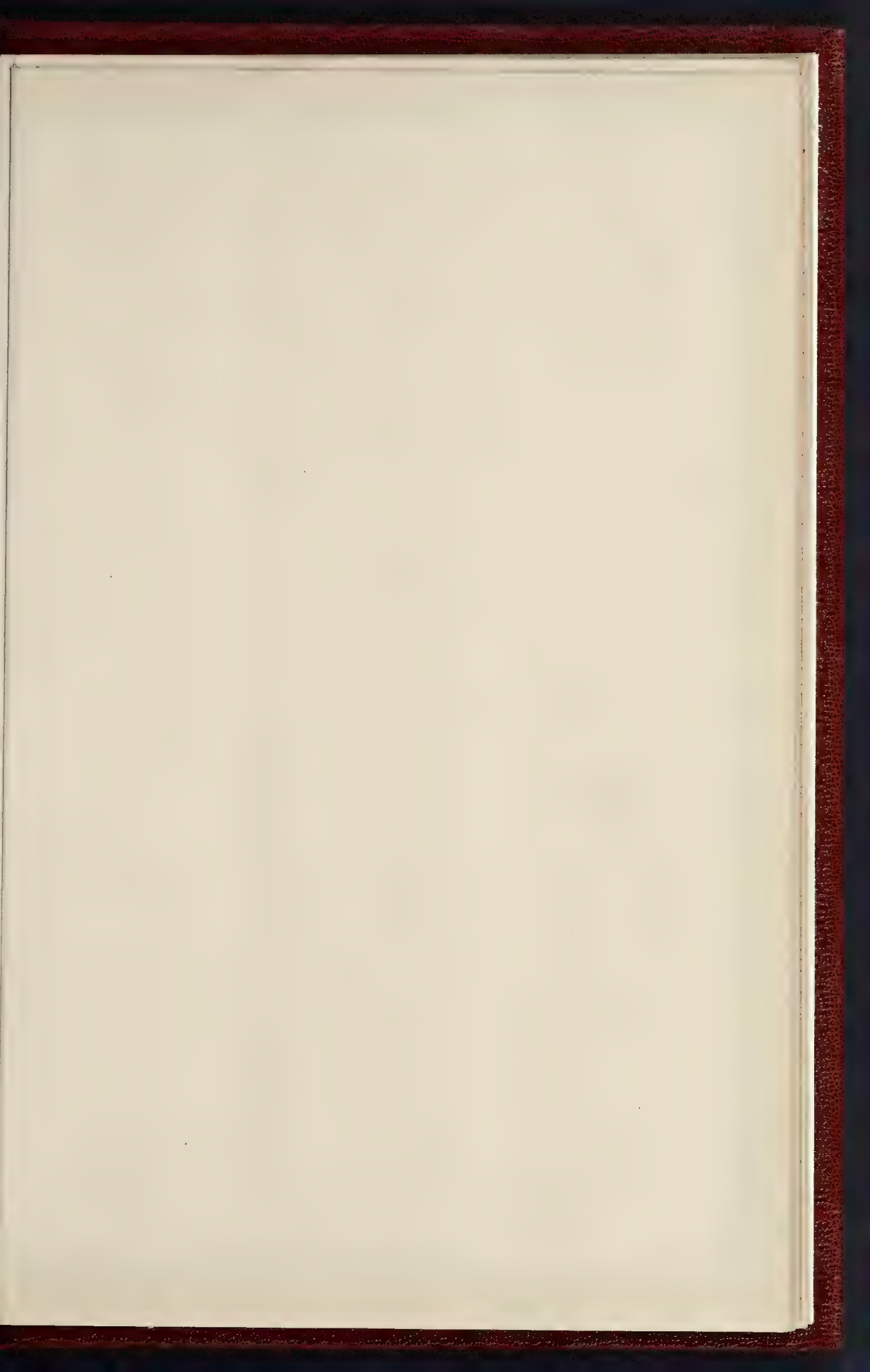
To the Editor of THE BUILDER.

### SEWER AND DRAIN VENTILATION.

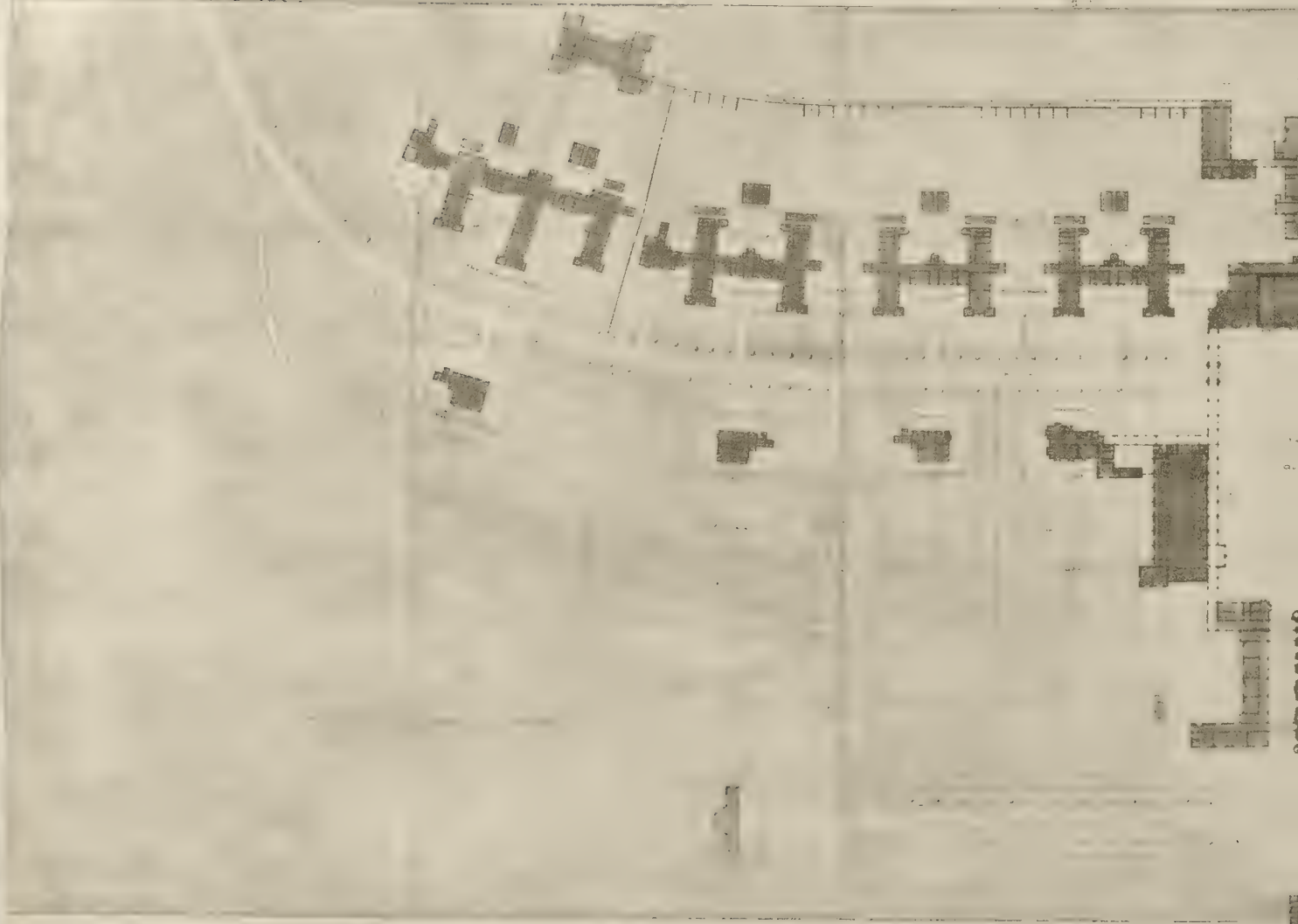
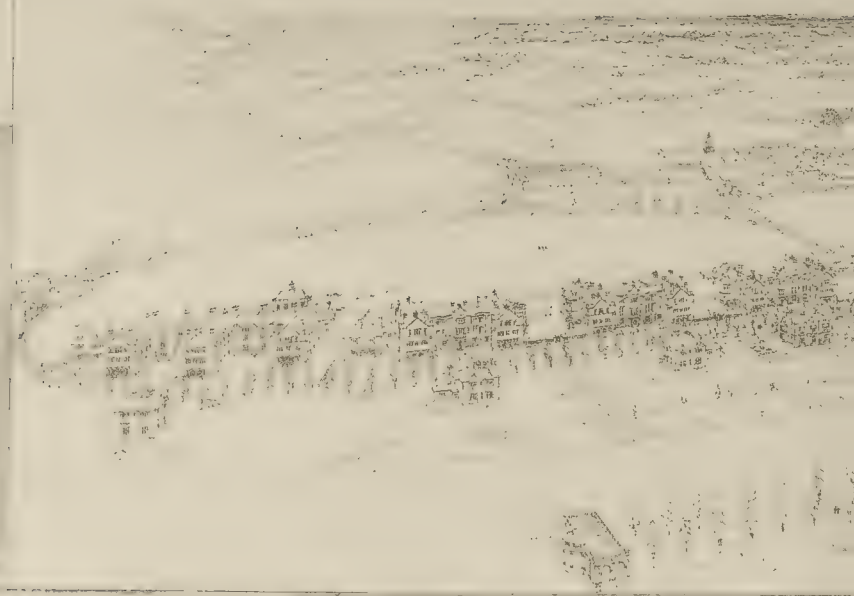
SIR,—In your issue of the 9th inst. Mr. Read refers to the experiments made by the Sanitary Institute, which showed that with neither a two-gallon nor a three-gallon flush was a six-inch drain and interceptor entirely cleared of solid matter, and he concludes that this result was caused by the presence of the interceptor. In my opinion, the interceptor is in no way responsible for this non-clearance, and this is shown, as pointed out by you, by the fact that the six-inch drain-pipe itself was not cleared. The real cause must be looked for not in the trap but in the pipe, and, to my mind, the experiments prove most conclusively what I have always contended, that a 6-in. pipe is much too large; had the experiments been carried out with a 4 in. pipe I am confident that both the pipe and the trap would have been cleared by a three-gallon flush. Provided the drain pipe is of sufficient size to carry off any possible rainfall, the smaller it is, within reasonable limit, the better. It is my experience that for all ordinary purposes a 4-in. pipe is large enough, and I have myself with perfect success drained large houses with a 4-in. drain, which will easily carry off the largest possible rainfall from a town house of 25 ft. frontage by a depth of 150 ft. I do not agree with Mr. Read that the interceptor call with safety be omitted, nor is it part of the householder's duty to ventilate the sewer, which must be left to the local authorities. Though I have great objection to unnecessary traps to house-drains and fittings as receptacles for filth, I look upon the interceptor as absolutely indispensable; but, on the house side of the trap, I believe in a perfectly free and unobstructed passage for the circulation of air, open at both ends.

I am much pleased to see Mr. Read's letter, not because I agree with him, but because it shows an endeavour to improve upon the things that be; most of us are far too apt to take things as we find them, and do just as the sanitary (?) inspector demands, to our great detriment.

I should like to add to this letter a word of protest against the manner in which the Public Health Act of 1891 is being carried out by some of the vestries: it is placed in the hands of so-called sanitary in-

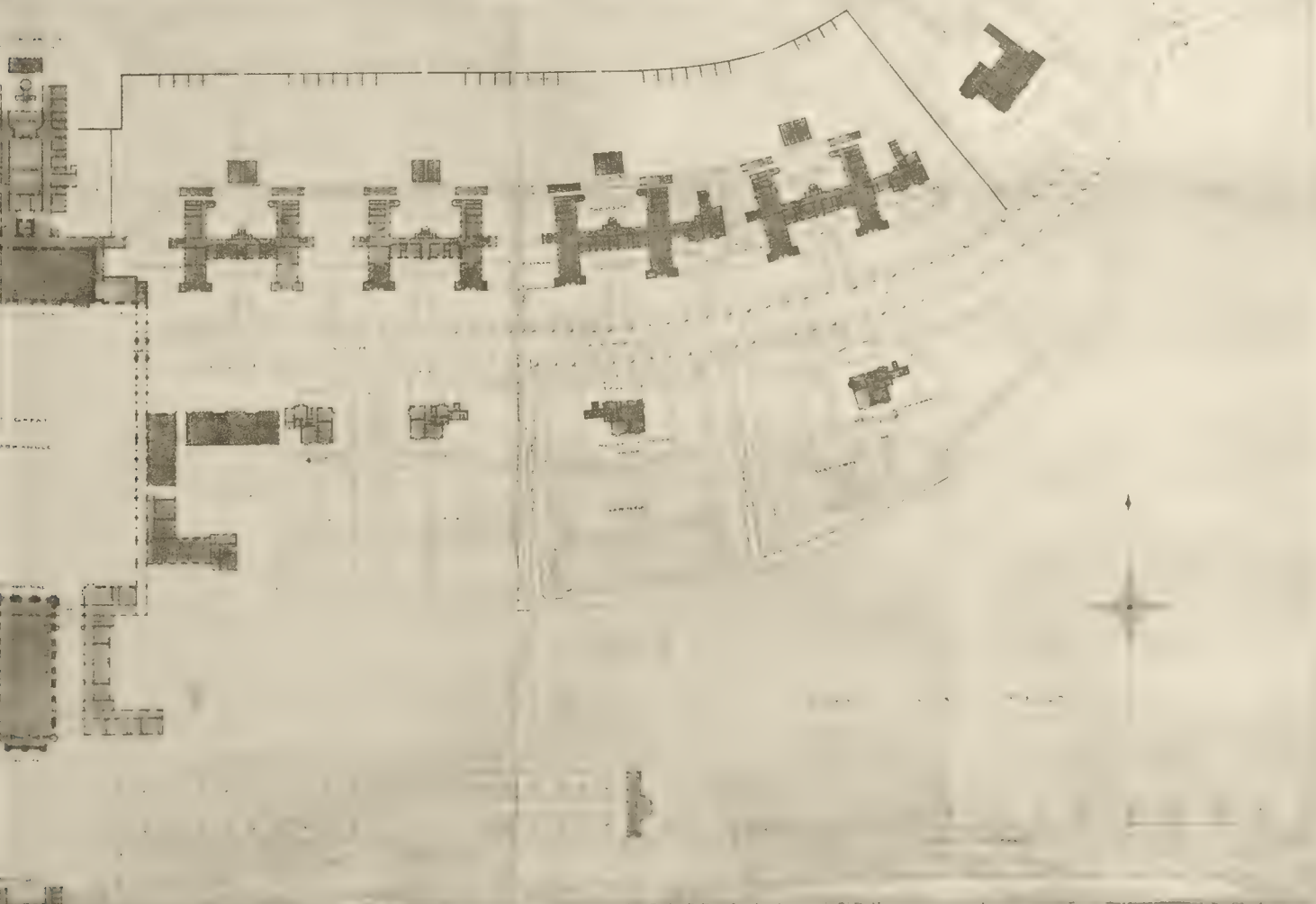








GENERAL VIEW OF THE CITY OF LONDON

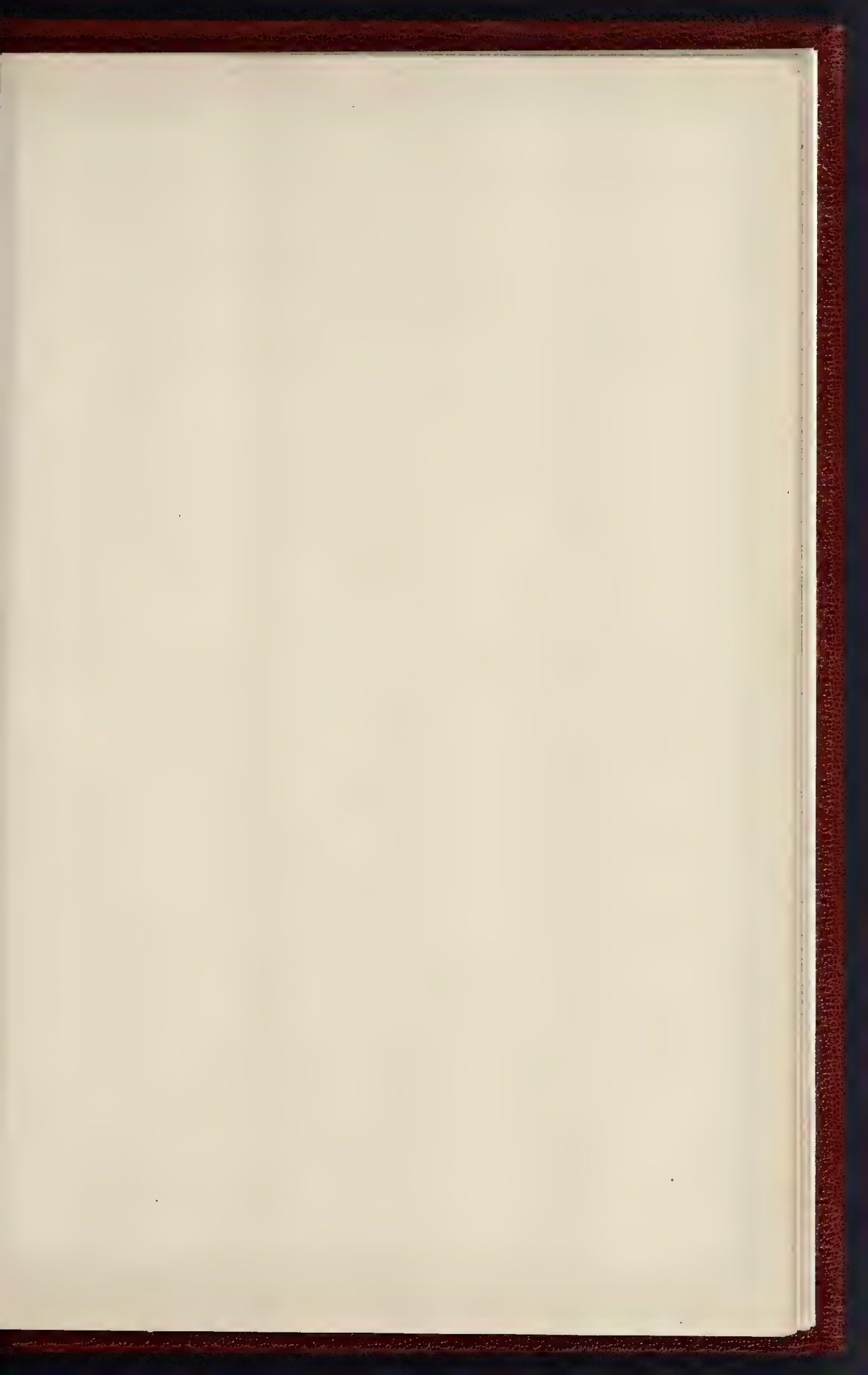


MESSRS. ASTON WEBB & E. INGRESS BELL, ARCHITECTS.

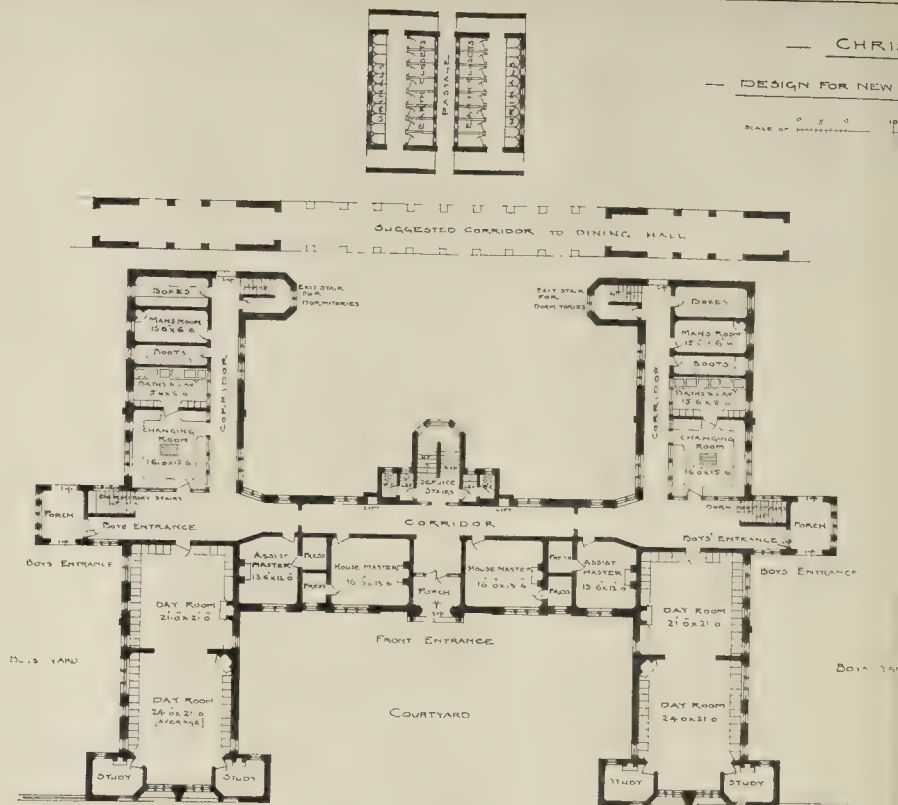
THE WHOLE BUILDINGS



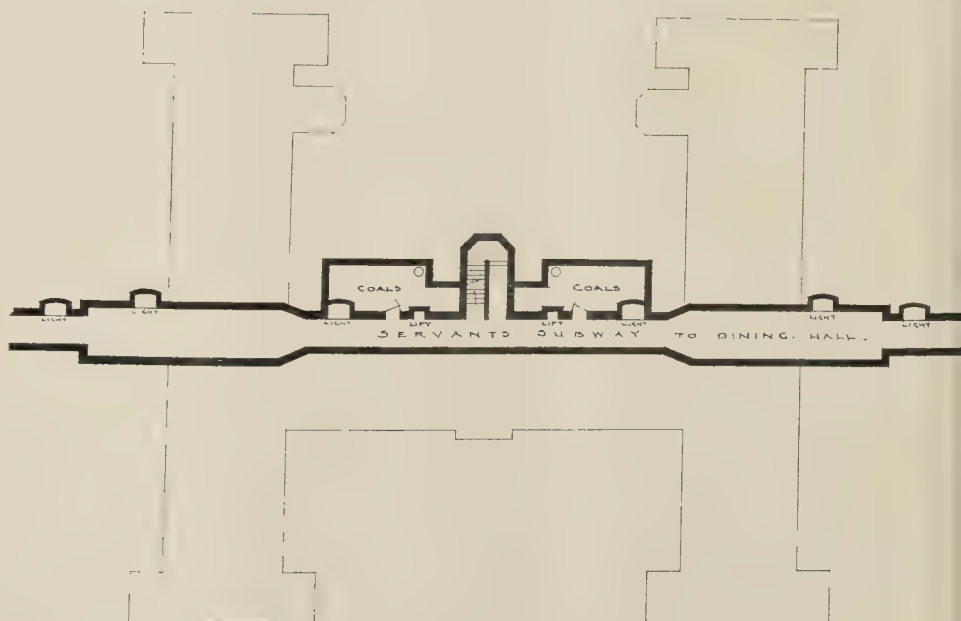








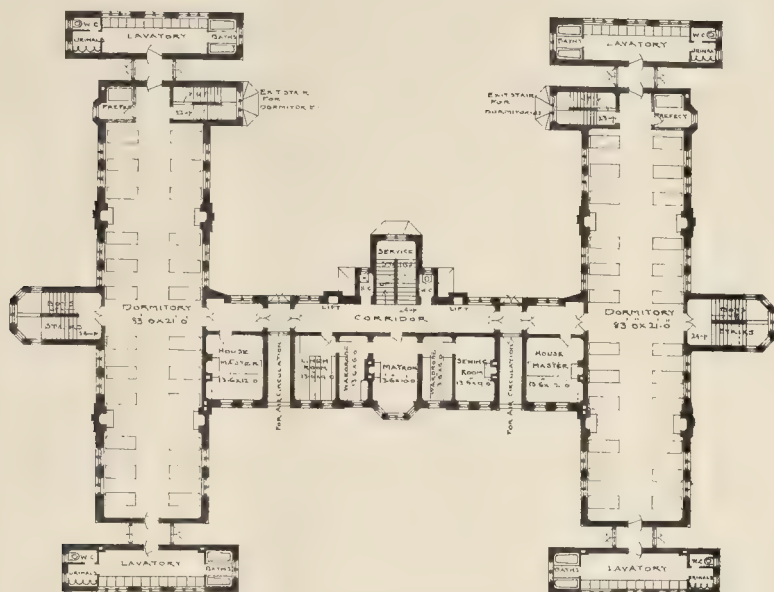
— GROUND FLOOR PLAN —



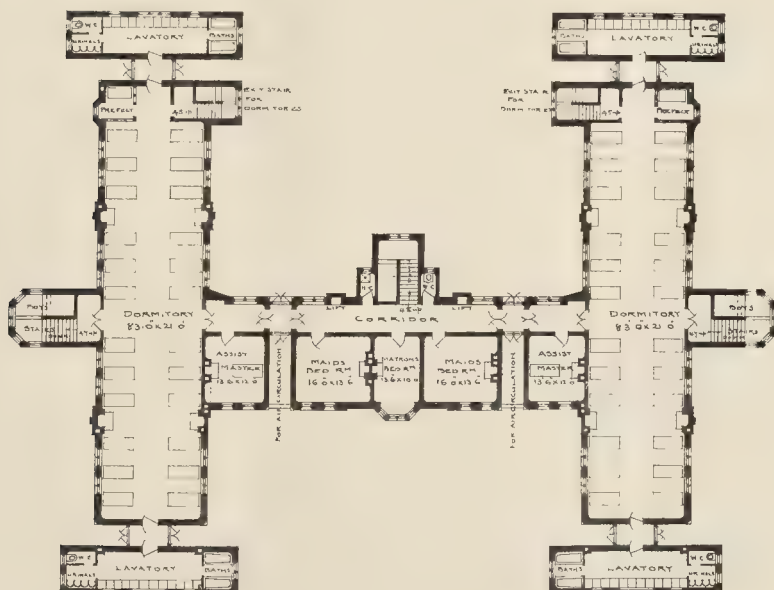
— BASEMENT PLAN —

HOSPITAL —  
SCHOOLS AT HORSHAM —

As 50  
Feet



— FIRST FLOOR PLAN —

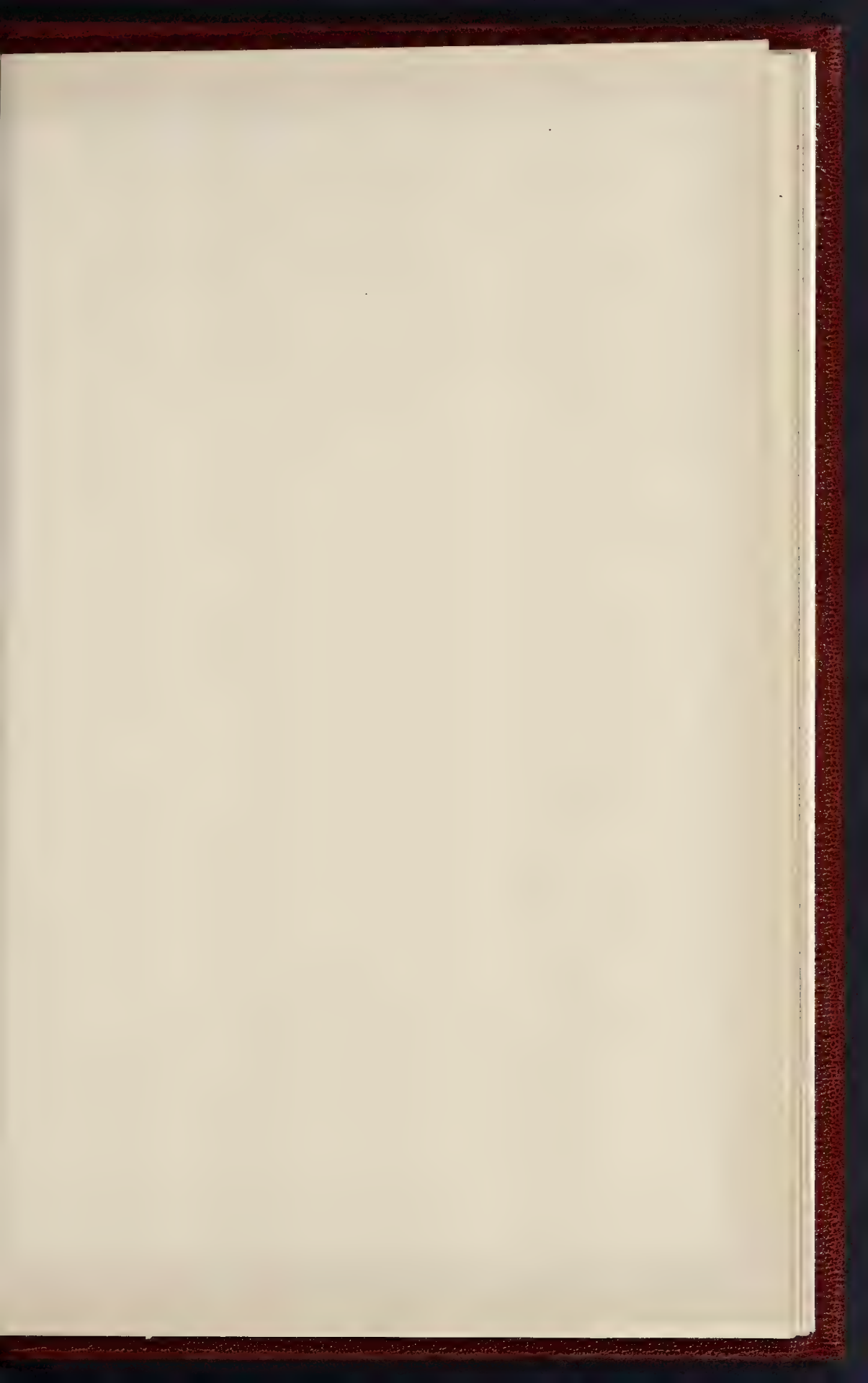


— SECOND FLOOR PLAN —

PHOTOGRAPHED BY H. E. & F. A. EAST HARDING STREET, LONDON, E.C.





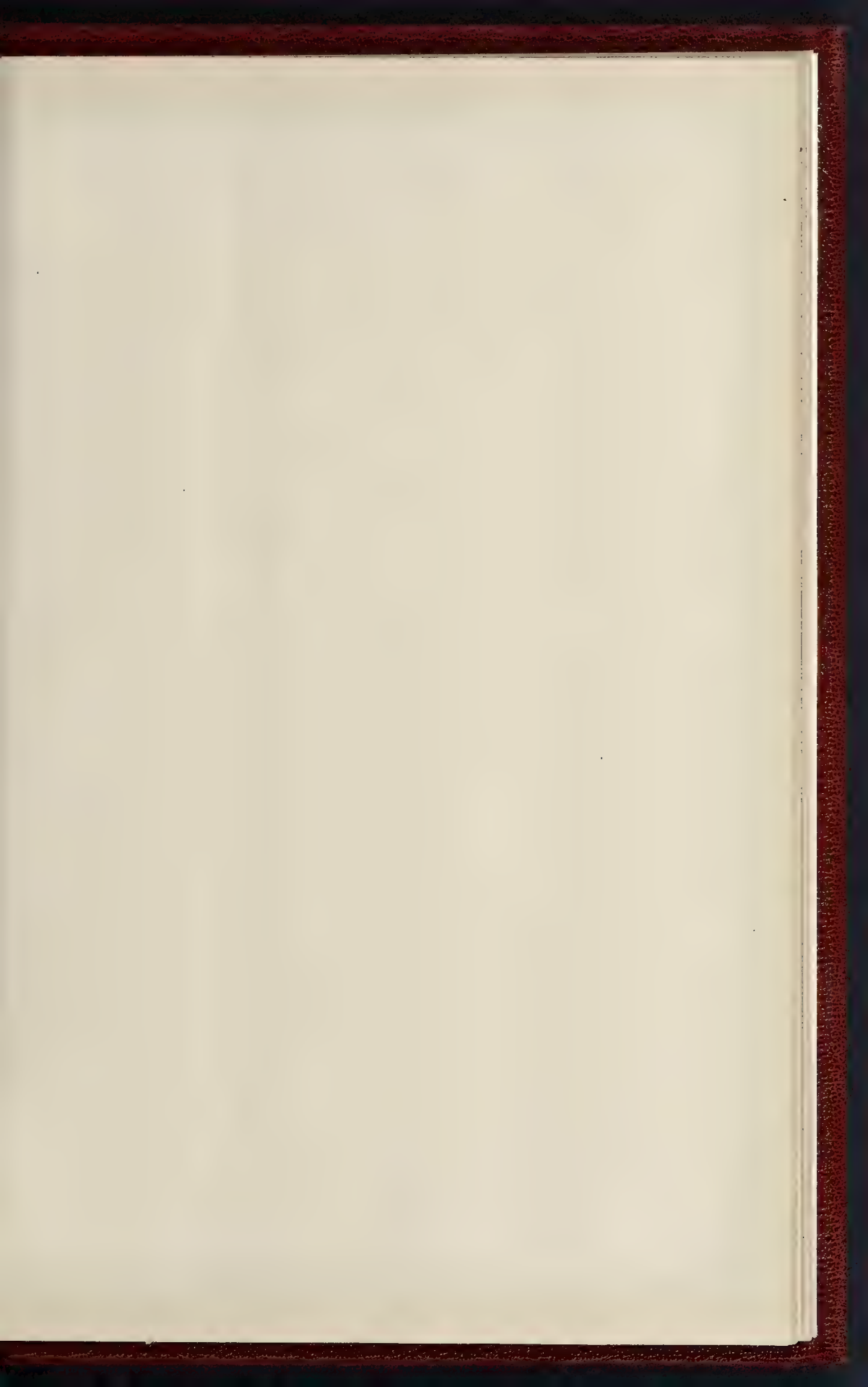






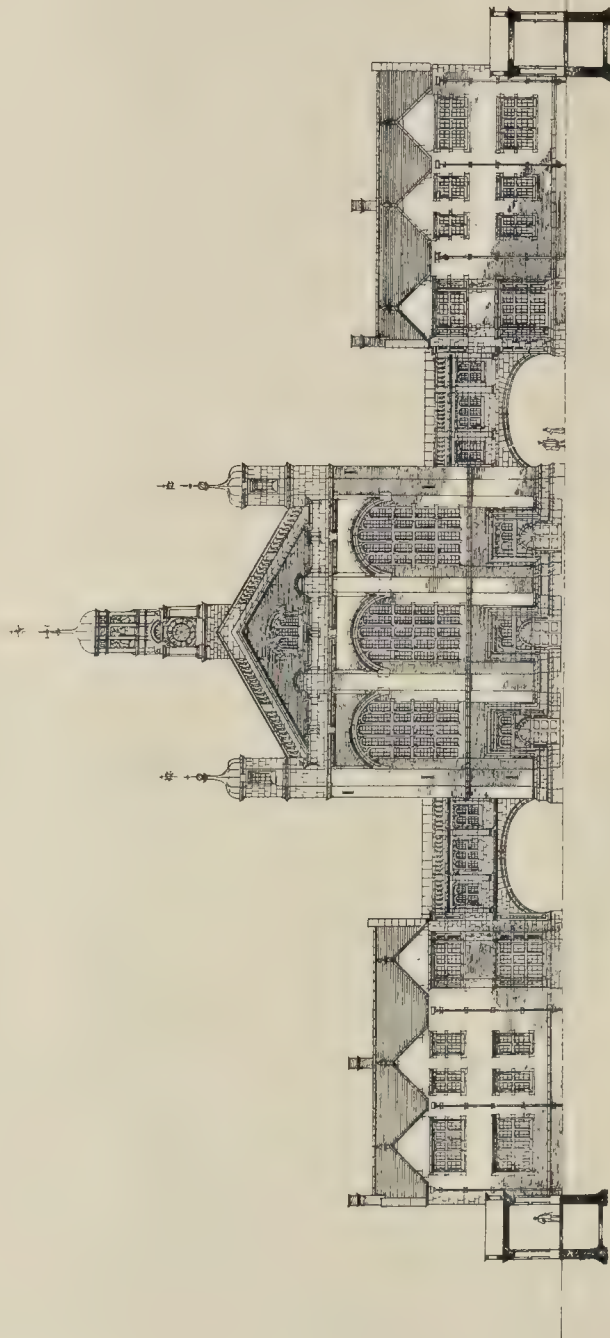
SCULPTURE AT THE ROYAL ACADEMY BAS RELIEF MR F E E SCHENCK SCULPTOR

*"O my even night,  
I am not sleep: many long have thou"*





THE BUILDER, JUNE 23, 1894.



ELEVATION TOWARDS THE SCHOOL QUADRANGLE

Scale 1/4" = 10' Feet









SCULPTURE AT THE ROYAL ACADEMY.—BAS-RELIEF. MR. F. E. E. SCHENCK, SCULPTOR.

*The woman is up a tree to love men  
with breath all incense, and with cheek all bloom."*









material binding together these various organic and mineral fragments, on which the nature of the rock as a building stone greatly depends, is also very variable, and here we have yet another element of comparison. In red sandstones it commonly consists of oxide of iron; in those of more sombre colours it may be some form of iron, argillaceous, or carbonaceous matter, and in those of lighter tint it may be of calcic carbonate, or silica. Certain sandstones have no matrix whatever, the sand grains having been compacted by pressure. From the point of view of durability, those with a siliceous matrix stand on the top of the list, whilst those having carbonate of lime come last. On the other hand, a sandstone in which the grains are entirely bound together by silica is extremely hard and difficult to work. The only means of ascertaining the precise nature of the matrix in such stones is by an appeal to the microscope; chemical analysis is powerless in that respect, seeing that the chemical composition of quartzose sand is identical with that of the same sand plus a siliceous matrix. Chemistry, however, is very useful in regard to the determination of the particular form of iron found in red and dark sandstones, on which the durability of the materials depend. Under the microscope, iron, in nearly all its forms, is quite opaque and structureless, though an approximate determination in reflected light is possible. This, however, is a phase of the subject that has never been thoroughly studied.

#### TRIASSIC SANDSTONES.

The three geological formations yielding most of the sandstones used for building purposes in England are the Triassic, Permian, and Carboniferous. Confining our attention for a moment to those of the Triassic System, it may be noted that this formation, known also as the New Red Sandstone, occupies a large area in the centre of England, and extends from Cumberland and Lancashire through Cheshire, Shropshire, and Staffordshire by the Bristol Channel to the south-east of Devonshire. It yields building stones more or less along the whole outcrop, but the best-known are in Lancashire, Cheshire, and Salop.

The micro-structure of Triassic sandstones, in the neighbourhood of Liverpool, has formed the subject of a searching investigation by Mr. G. H. Morton.\* He describes the material raised at Stand Quarry, Croxteth, as a soft, red sandstone, having rounded grains of quartz  $\frac{1}{16}$  to  $\frac{1}{8}$  inch diameter, coated with ferric oxide, mixed with grains of kaolin not coloured; and remarks that "This sandstone, although composed of rounded grains, has evidently been extensively used as a building stone, as the quarry is a very large one." Another from Whitfield Lane, Tarbock, is said to be a very soft yellow sandstone, having rounded grains of quartz and kaolin coated with hydrated ferric oxide; there are large grains of quartz  $\frac{1}{8}$  inch diameter, embedded in a matrix of smaller grains which vary from  $\frac{1}{16}$  to fragments  $\frac{1}{1000}$  inch diameter. The grains from  $\frac{1}{8}$  to  $\frac{1}{16}$  inch are well rounded, and the largest occur in distinct laminae, and are quite smooth. The red sandstone of Dacres Bridge, Tarbock, which has been used as a building stone, in spite of its softness, is described as having rounded seed-like grains of quartz, coated with ferric oxide, with pieces of kaolin and other minerals. The hard brown sandstone of Woolton Quarry, Liverpool, contains numerous quartz and other pebbles. Under the microscope it is seen to be composed of rounded and crystallised grains of quartz coated with ferric oxide, from  $\frac{1}{8}$  to  $\frac{1}{16}$  inch diameter, and minute fragments and dust to  $\frac{1}{1000}$  inch across; mica occurs in little plates.

The above may serve the student as types of Triassic sandstone structure, and it is not necessary for us to enlarge on the subject. The building stones from this formation are noteworthy for the abundance of scattered pebbles they frequently contain, amounting in certain parts of the country to a true conglomerate. Such, for instance, is the well-known Dolomitic conglomerate of Devon and Somerset, though this might be more suitably described as a breccia in places. As a class, the Triassic rocks of Devon are not noted for their durability. They have been worked for centuries, and the products of certain localities have won considerable reputation. The conglomerate at Heavitree Quarry, near Exeter, has long been worked under the name of Wonford stone. At Ugbrook Park, near Chudleigh, a warm red-coloured sandstone is raised; and a similar one

but varying in colour from a dirty buff or drab to pure white, is quarried in the neighbourhood of North Tawton, Sampford Courtenay, Exbourne, and Hatherleigh. The Grinshill Quarries, near Shrewsbury, produce stone of light grey, light yellow and reddish brown tints. At Hollington, near Uttoxeter, a light brownish-grey stone is raised; and another, sometimes micaceous, comes from Park Quarry, Tixall, Staffs—but the quarries in Triassic sandstone are too numerous to mention specifically. The student will find good examples of the use of the material in the ancient City of Chester; a walk round the old walls will soon make him familiar with the pebbly nature of some of the stones. The cathedral there and also at Worcester have been restored in recent years with the red sandstones from quarries near Dunham, and from Ombersley and Hadley Quarries, Worcester, respectively, both of Triassic age. The fine-grained red sandstone of the New Red Series raised at the Moat Quarry, near Carlisle, is well known in the North of England and Scotland; it has black lines, which disappear on exposure to the weather, and is slightly argillaceous.

#### PERMIAN SANDSTONES.

The sandstones of Permian age in England are not distinguished for their durability, whilst their colour is generally decidedly objectionable, with the exception of those quarried along the valley of the Eden, and near St. Bees Head, Cumberland. They are mostly of bright red tints, and have been used, amongst other places, at Llanthyllty. If we just cross the border into Dumfriesshire, however, we find this formation yielding remarkably good stones. At Corsehill, near Annan, a fine-grained red sandstone has been worked for many years, which has earned a wide reputation and is well known in the London market. Its micro-structure has been described in this series in another connexion, where it was also figured. We may remind the student that the stone is mainly composed of quartz grains, both angular and sub-angular, with a small proportion of kaolin fragments coated with peroxide of iron; minute flakes of mica are common, and small red specks of some indeterminate mineral make their appearance here and there, whilst there is also a little chalcocidal infiltration. The Corncockle Quarry, near Lockerbie, in the same county is another example of a working in the Permian beds. The stone is of a deep red tint, fine-grained, of medium hardness, and appears to weather well. The red sandstone from Gate-lawbridge Quarry, near Thornhill, has been exploited for at least 200 years, is much used in Glasgow and more recently in Edinburgh. It consists mainly of quartz grains cemented together by peroxide of iron, and is of very fine texture. Locharbroggs Quarry, also in Dumfriesshire yields a Permian sandstone of pale red tint and fine grain; and the Ballochmyle Quarry, near Mauchline, Ayrshire, provides an equally fine-grained stone, but of a brighter red colour. In fact, it may be stated that, wherever the Permian sandstones of the south of Scotland are sufficiently hard they are raised, but not to the same extent as at the quarries mentioned.

#### CARBONIFEROUS SANDSTONES.

The majority of the sandstones used for building purposes in this country are derived from the Carboniferous System. In and around Bristol we have the Pennant stone, in the Forest of Dean and surrounding the South Wales coal basin, in Staffordshire, Yorkshire, Lancashire, Denbigh, Flint, Durham, and Northumberland—wherever the Yoredale Rocks, Millstone Grit, Calciferous Sandstone, or the sandstones interstratified between the various coal-seams crop out—there we find quarries which have yielded the sandstones so well-known to architects in the West and North of England. We have visited many, and have described several on former occasions, but our knowledge of this branch of the subject is not as complete as we could wish. At the same time we have seen sufficient, and have experimented with enough samples of the stone, to enable us to draw a few deductions which may not be without some permanent value. Certain new quarries in the Carboniferous sandstones of Gloucestershire will be described in detail, and the general micro-structure of the stone given.

The Carboniferous System in Scotland has likewise yielded an enormous amount of building material, especially in the vicinity of Edinburgh, where the sandstones have formed the subject of special study by an architect, Mr. George Craig,\*

though not in regard to their microscopic characters. Craigleith quarry is known all over the country, and the stone therefrom was long the principal material used in the public and private buildings of Edinburgh; it consists almost entirely of quartz grains in a siliceous matrix, and is consequently very durable, but contains about 1 per cent. of carbonate of lime. It is of a grey tint, and very hard and close. Mr. Craig remarks that "All the buildings of Craigleith stone (in Edinburgh) are practically unaltered by the weather, and polished faces retain their original gloss and clear appearance." Then we learn that "no houses are built entirely of it now"—competition again, we presume. The Craigmillar quarry, about two miles south-east of Edinburgh, yields stones of purplish white and cream colours, hard and full of pebbles which stand the weather well; Ravelston Quarry, one and a-half miles west of the city, was once very extensively worked, and is to a more limited extent at the present day, the stone is greyish, fine-grained, and occurs in massive blocks; a little to the west of this is the Ravelston Black Quarry, recently re-opened, yielding fine, hard stone of dark grey tint. Hailes Quarry, four miles west of Edinburgh, gives us three kinds of sandstone, viz., dark grey, red, and blue; it is hard, close-grained, and contains a large quantity of mica. The three quarries near Granton, Midlothian, which in times gone by have yielded an enormous amount of good hard stone of cream tint, are now flooded out; but a little above Slateford, at Redhall Quarry, red and "white" sandstones wrought with considerable facility are raised. Dalmeny Quarry produces a light grey stone of very fine grain; near West Calder is the Hermand Quarry, also in stone of grey tint, hard and compact; at Currie Glen Quarry, Borthwick, also in Midlothian, stones greyish mottled with brown, also purplish grey mottled with yellow, and whitish grey mottled with yellow occur, of fine grain.

The Carboniferous system in Llanthyllty yields the celebrated grey fine-grained sandstone of Binny Quarry, near Uphall; in Fife we have the whitish (sometimes mottled brown) stone of Grange Quarry, in Lanarkshire there is the white, coarse stone of Auchinleck Quarry, Cleland, near Motherwell; and in Berwickshire a warm, cream-coloured sandstone of fine grain and easily wrought is raised at Whitstone Newton Quarry. The same formation in Stirlingshire produces a cream-coloured stone of very fine grain at Polmaise Quarry, near Banockburn, near which place a somewhat similar stone is also raised at Pleau Quarry; close to the town of Stirling there is the Danmore Quarry in stone containing more carbonate of lime and magnesia than is usually found in good sandstones, it is of a cream tint, hard and fine-grained, and its structure is remarkable as showing a number of small, round holes; whilst near Glasgow, celebrated sandstones of pale grey tints come from the Giffneuk quarry.

#### OBITUARY.

MR. JAMES MEDLAND.—On the 18th inst., at Gloucester, died James Medland, architect and the son of an architect, at the age of eighty-six. He came to Gloucester as chief assistant to the late S. W. Dankes, remaining in that position when the practice was continued by Dankes & Hamilton. When Mr. Dankes left Gloucester for London the firm became Hamilton & Medland. Mr. Hamilton after a time left Mr. Medland in sole possession. After some years he was joined by Mr. Maberly, and after Mr. Maberly's retirement, by his son. Mr. Medland held for many years the office of County Surveyor. Since the office was first opened in Clarence-street, Gloucester, by Mr. Dankes many buildings have been carried out, such as lunatic asylums, workhouses, cemeteries, public halls, hotels, markets, churches, chapels, police stations and petty sessions courts, mansions, and smaller dwellings, workmen's cottages, and sundry other buildings; in the designs of all of which Mr. Medland took the chief part. His eldest surviving son is still in practice in Gloucester, and a younger son in London. Mr. John Medland was for many years in the office of Sir G. O. Scott, R.A.

MR. W. C. MARSHALL, R.A.—Mr. William Calder Marshall, R.A., died on the 16th inst., at the age of eighty-one. He was born and educated in Edinburgh, and for some years studied the art of sculpture. He went to London, and in 1836 visited Rome. He had in the previous year exhibited for the first time at the Academy, and in 1839 he went to reside permanently in London. He was elected an Associate of the Scottish Academy in 1842, of the Royal Academy in 1844, and a Royal Academician in 1852. He did a good deal of work for the Art Union, and his "Dancing Girl Reposing" obtained the

\* "Proc. Liverpool Geological Soc.," vol. v. (pt. 2), 1875, pp. 52 et. seq.

\* "Trans. Edinburgh Geological Society," vol. vi. part (iv), 1872, pp. 254, et. seq.







**SEA WALL, FILEY.**—On Tuesday the sea wall at Filey, which it was found necessary to erect to protect the land from the inroads of the sea, was opened by Lord Herries, the Lord-Lieutenant of the East Riding. Commencing at the North Ravine, the sea wall runs in two sections to the Crescent Hill, a distance of over seven hundred yards. A slipway, which divides the two portions near the Spa Saloon, is spanned by a steel bridge. The foundation of the wall is of concrete, and it is further protected at its base by a concrete apron, backed with a layer of hand-packed stone. The space between this layer and the front of the wall has been filled with concrete, laid in mass, a wide layer of this material being placed with concrete blocks of superior quality to resist the action of the waves. The structure has an average height of 19 ft. above the sand, the promenade being 11 ft. above high-water mark. A bull-nose ledge placed immediately underneath the coping has the effect of turning the waves from the promenade, and throwing them back into the sea, and the coping is surmounted by an iron railing 3 ft. 4 in. in height. The promenade consists of an asphalted pathway 12 ft. wide, leaving behind a large open space, which will be laid out in ornamental plots, and will also afford accommodation for shelters, and, if desired, for a band-stand. The works have been carried out by the Local Board at a cost of 15,000l. The engineer was Mr. Fairbank, and Messrs. Dickson were the contractors. Mr. Barnes was clerk of works.

**SEWAGE DISPOSAL SCHEME, BATH.**—The Town Council of Bath have been considering the question of sewage disposal for some time, and have had a preliminary scheme under their consideration. At a meeting of the Town Council last Tuesday a report was presented from the special committee appointed to deal with the subject. The committee reported that they had entered into provisional contracts with the owners of a site which might be suitable for chemical precipitation. They advised that the question referred to them by the Council, as to the levels of the new intercepting sewers, should be referred to the expert as part of the whole matter referred to him. The committee recommended the Council to engage the services of Mr. W. H. Radford, C.E., of Nottingham, to furnish a report upon the whole subject. In consequence of information afforded by Mr. Radford, the committee had sent a deputation to the Local Government Board offices, and had ascertained that if the sewage was treated chemically, land would have to be used for filtering the effluent before discharging it into a river. The Town Council approved the recommendations of the committee. It is expected that the sewage of Bath will have to be collected by means of intercepting sewers, and conveyed to one outfall for purification. The scheme has been estimated to cost between 70,000l. and 80,000l. The population of the city is about 52,000.

#### FOREIGN AND COLONIAL.

**FRANCE.**—A subscription has been opened in Paris for the purchase of Turner's "Ancient Italy," which it is desired to offer to the Louvre. The picture is at present exhibited at the Sedelmeyer Gallery, Rue de la Rochefoucauld, as well as a certain number of other paintings of the English School, including a sea-piece by Turner, various portraits by Lawrence and Gainsborough, and landscapes by Crome and Constable.—**MM. Marquette and Ernest Barrias**, the eminent sculptors, have been elected members of the Conseil Supérieur de l'École des Beaux-Arts.—**M. Henri Bouillon**, the sculptor, has just completed the model for the monument to Henri Mürger, which is to be inaugurated in the autumn, in the Luxembourg Garden. The monument comprises a group in marble "La Galté et la Tristesse se donnant le Main," surmounted by a bust of Mürger.—The Louvre has bought the Carpeaux Sale the drawing of Napoléon III. in his coffin, the plaster model of the "Dance" group, and three terra-cottas, "Le Corps d'une Naufragée," "Venus Captivant l'Amour," and "Paul et Virginie."—**A congress for the development of "Christian Art"** is to be held in Paris, from the 25th to the 27th of this month.—The exhibition of the "Envois de Rome" has just been opened at the École des Beaux-Arts.—An exhibition of "Celtic Art" is announced at the "Cercle de la Librairie," in the Boulevard St. Germain.—**M. Joseph Chéret**, a well-known decorator and ceramic artist, has died, after a long illness. He was brother of Jules Chéret, the draughtsman, and brother-in-law of MM. Louis and Pierre Carrier-Belleuse.—The death is also announced at Garennes, of the painter Henri Bramat, at the age of forty-one. He was a pupil of M. Bouguereau and obtained a Third Medal and the Prix de Rome in 1879, and a Second Medal in 1880. He exhibited two pictures this year at the Champs Elysées, "Souvenir d'Été" and "Reflets de Soleil."—**M. Jules Laroche**, architect and member of the Société Centrale, has died at Corbeil at the age of sixty-four. He studied at the École des Beaux-Arts and in the atelier of M. Guépin. He was architect of a good many private houses as well as public

buildings, among the latter the Palais de Justice at Corbeil.—The monument raised by public subscription to Barye, the great animal sculptor, was inaugurated on Sunday last. The monument, situated at the extremity of the Ile St. Louis between the two lengths of the Pont Sully, is designed by L. Bernier, architect.—The War Department having refused a sufficient indemnity for the demolition of the ramparts of Perpignan, the municipality of that town has given up the project, confining itself to enlarging the various gateways in the fortifications which give access to the town.—**M. Joseph Reinach** has laid before the Chamber of Deputies a proposition for the creation of a Museum (Dépense des Musées), to provide funds for the purchase of works of art intended for the State museums.—**M. Injalbert**, the sculptor, has finished the model of the monument to be erected at Pezenas to the memory of Molière. The bust of the great comedian is placed upon a pedestal three metres high. In front are symbolical attributes of "Comedy," on the left a figure representing a "Soubrette" holding a nosegay; on the right is a figure holding a sceptre, and features which are a reproduction of those of M. Coquelin cadet.

**GERMANY.**—The Emperor has decided that five large bells shall be hung in the belfry of the Emperor William Memorial Church. They will be cast from cannon captured in the Emperor's three campaigns, from designs by Schwechten and other well-known artists. The church is to be consecrated on September 2, 1895.—The municipality of Berlin has appointed a sub-committee to report on the best methods of improving the communications with Treptow in view of the 1896 exhibition. It is said that a settlement will be shortly arrived at with Messrs. Siemens & Halske so as to enable a start to be made on the proposed overhead electric railways.—A new chapel for the cemetery of the Orthodox Greek community has recently been consecrated. It is in the Russian style, with a high octagonal tower, and was erected from the designs of Herr A. Bohn.—The opening of the new Imperial House of Parliament, fixed for October 18, is again indefinitely postponed.—Professor Carl Becker has been unanimously re-elected President of the Prussian Royal Academy of Arts by the Senate of that body. The late Professor Böckmann's place at the Art Schools will be taken by Professor Carl Seim.—The next general meeting of the Society of German ironmasters is to be held at Düsseldorf on July 15.—The Society of Munich artists have resolved to make a start on the "Kunstler Haus" which is to be erected from the plans of Professor Seidl at a cost of nearly 40,000l., of which amount all but 2,000l. is provided.—The Prince Regent of Bavaria has unveiled a monumental fountain at Würzburg dedicated to him by that city. The design represents "Franconia," enthroned, crowning a medallion of the Regent with a laurel wreath.—The surface drainage works at Heidelberg Castle are nearly completed.—The prince of Hohenlohe, who is an ardent antiquarian, has entrusted Dr. Ziegeler with an investigation of the Roman roads of the province. At Laugenschlingen a well-preserved Roman Villa has been unearthed.—The "Pontes Longi," described in Tacitus I. 63, have, it is believed, been discovered in the "Weissen Venn," near Borken, where a roadway, formed of the trunks of trees has been uncovered for a length of 40 yds. The excavations are being continued.—**AUSTRIA.**—The Emperor has expressed his satisfaction with the designs of Messrs. G. and C. Lugano, for a monument to the late Crown Prince Rudolph to be erected in the Achilleion on Corfu.—Messrs. V. Arneth & Süss have been re-elected President and Vice-President of the Vienna Academy of Sciences.—The Ministry of War is about to sell the Alser barracks at Vienna to the authorities of the General Hospital, with a view to the rebuilding and extension of the Medical Schools, where the accommodation is very bad.

#### MISCELLANEOUS.

**SHELDON'S SUSPENSION LEVEL.**—This little instrument, resembling the ordinary level used in the joiner's shop, has been devised for the purpose of not only ascertaining if a surface is horizontal, but also for determining the differences of level in building and survey work, on occasions when it may not be convenient to be lamped with a telescope level and its tripod. It consists of a sensitive spirit bubble, mounted in a metal tube from 5 to 7 ft. in length. At the ends of the tube are feet, enabling it to be used as an ordinary straight-edge level, and over these are projections which have also been adjusted so that it may be employed as a spirit level to be held against beams, ceilings, &c., the position of the bubble being easily seen from underneath. The upper projections also form hooks, so that the instrument can be suspended upon a cord, which, if stretched moderately tight between two upright rods, and secured to each, so that the points of attachment shall be on the same horizontal line, the level, when suspended midway between the rods, will obviously hang horizontal also. Consequently, to find the difference in level between two places, all that is required is to set up a rod at one of them and attach a cord to it at any convenient height. The cord being drawn fairly taut must then be

secured to the second rod at such a height that the instrument which has been suspended on the cord, midway between the rods, hangs horizontally. The difference in height from the bottom of the rods to the points of attachment of the cord, will of course give the rise or fall between the two places. Care be taken to hang the instrument at the centre of the cord, very good results may be obtained, the error not exceeding one or two inches per quarter mile. Messrs. Elliott Brothers are the makers of the level and they also supply graduated rods with sliding collars and clamping arrangements, and a specially-prepared enamelled line suitable for the purpose.

**CANALS OF FRANCE.**—Although the traffic on French canals and rivers had increased at the end of 1891 by 28 per cent. over that of 1881, the year chosen for comparison by a committee of the Chamber of Deputies appointed to report upon the subject of inland navigation, at the end of 1893 this increase was checked and fell to 25 per cent. The causes of the decrease were the depressed state of French trade last year and the effects of a reduction of from 27 to 33 per cent. on traffic sent by slow goods trains. According to the report of the committee referred to, the increased inland water-borne traffic is entirely due to legislation and the improvements carried out in consequence thereof. In 1879 a law was enacted that all locks should be rebuilt to a common size, so as to admit the passage of boats 300 tons burden, 125 ft. long, 16 ft. 4 in. wide, and 15 ft. 10 in. deep. Improvements were also made in the courses of the rivers Rhone, Soane, and Seine. The increase in the total length of navigable canals and rivers between 1881 and 1891, the period reported upon, from 7,437 to 7,660 miles, was small, but the distance along which a boat 120 ft. long could be taken, rose from 906 to 2,494 miles. A boat of 300 tons burden can now be hauled direct from Havre to the frontiers of Alsace, and from Dunkirk to Lyons, but there remains much to be done to complete the network, large gaps existing between the Marne and Saone, the Saone and Besançon, the Rhone and Marseilles. In 1880 all inland navigation dues in France were abolished, forming another cause of the impetus given to the carriage of heavy goods by water; but the necessity for some sort of tolls levied locally for the repair and use of canals has lately been felt, and an agitation set on foot for their enactment. Most of the hauling is done by horses, and the remainder by cattle hired from the farmers along the canals. Drawbacks to the expansion of canal navigation are defective arrangements as to traction and want of organisation as to freight.

**ARCHITECTURAL ASSOCIATION VISITS.**—The Architectural Association repeated last Saturday their visit to Eton College. As a full account of their previous visit to Eton appeared in the *Builder*, vol. lvi., page 459, we need not do more than mention the visit on this occasion.

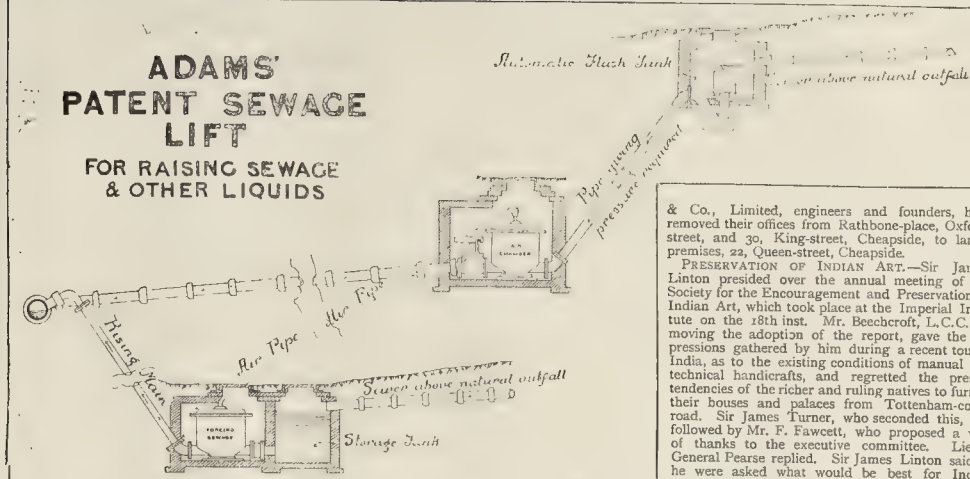
**THE JUNIOR ENGINEERING SOCIETY.**—Last Saturday afternoon the members of this society visited Wembley Park for the purpose of inspecting the great tower in course of construction there. The party, numbering upwards of seventy, were shown over by Mr. W. Gilbert, the resident engineer, and the contractors, Messrs. Heaman & Froude, and other gentlemen. The erection has advanced to the first platform, at an elevation of 150 ft., to which the members ascended by a cage capable of raising six at a time, and worked electrically. The method of building up the steelwork composing the four groups of inclined legs by aid of four electric cranes, one at each group, was explained. Each of these cranes, supplied with current from a central station, carries a 14 h.p. motor, taking about 120 amperes at 105 volts, connected by gearing with a barrel 21 in. diameter; a load of 8 tons can be lifted at a speed of 20 ft. per minute. The total height of the tower will be 1,150 ft., and the estimated total weight 7,000 tons. The foundations consist of four groups of four separate concrete blocks, each group being placed at a corner of a square of 250 ft. sides. Four lifts are being provided to work vertically up the centre of the tower; two will ascend only to the first platform, the other two travelling the entire height. Each lift will be driven by a separate winding engine situated immediately under the lift cages in a circular underground-level concrete chamber, 55 ft. 8 in. internal diameter. The wall for this has been put in by an annular trench, and the excavation of the centre part was going on at the time of the visit, two steam winches being employed for raising the square wood tips as they were fitted by hand; the men on this part of the work are now engaged night and day, with a view of completing the chamber as speedily as possible, so that the engines may be laid down.

**COMMISSIONERS OF SEWERS.**—At the meeting of the Sewers Committee of the City of London held on the 20th inst., a deputation of ratepayers and occupiers prayed for a much-required improvement in Bishopsgate-street, the widening of the approaches from that thoroughfare to Great St. Helen's. After hearing Mr. Wragge and Mr. Craven in support of the memorial, the matter was referred to the Finance and Improvement Committee. Mr. A. C. Morton, M.P., called attention to the inconvenience resulting from the stoppage of the works on the new offices, in consequence of a



## ADAMS' PATENT SEWAGE LIFT

### FOR RAISING SEWAGE & OTHER LIQUIDS



representation made by Mr. Shaw, that if the new offices were built on the site selected the Guildhall Library would suffer considerable damage. The chairman pointed out that a large sum of money had already been spent on the site, and that the raising of the question at so late a period was fraught with very great inconvenience. An assurance was given that the City Lands Committee would lose no time in considering the question, and the subject then dropped. Mr. Gordon gave notice that he would move, at the next meeting of the Court, that the continued delays in the re-building of Moorgate-street Station and the improvements in that part of the City dependent thereon, be brought to the notice of the solicitor. It was resolved to transfer the consideration of the question of erecting a new refuse destructor from the Wharf Committee to the Streets Committee.

**ADAMS' SEWAGE LIFT.**—The Adams' Patent Sewage Lift Company have fitted up at their offices, 5 and 7, Old Queen-street, Westminster, a large working model illustrating their system of automatically raising sewage, or any liquid, from a low to a higher level. The principle they adopt will be clearly understood from the section above. These sewage above the natural outfall flows through an automatic flush-tank, and descends into the upper air-chamber. By its entry the air contained in this vessel is compressed and forced into a similar chamber placed at a lower level, and which has been already filled with sewage below the natural outfall by gravitation. The air forces this sewage up the rising main to the outfall sewer, it being prevented by a valve from returning to the storage tank. After the sewage from the higher level has filled the upper air chamber it escapes to the outfall sewer through a weighted automatic relief valve. The lower air-chamber being thus emptied a further amount of sewage enters and the above operation is repeated. By this means the high-level sewage of a district may be used to raise the low-lying sewage to such a height that it may flow to the outfall. Water, either from a high tide or from the mains of a water company may, of course, be employed for the purpose of giving the necessary pressure. It will be noticed that the system is entirely automatic, and that there are but few moving parts, which is an important point in an apparatus of this kind. The principle can be made use of for raising any liquids, and an inspection of the model we have referred to will dispel any doubts that might exist as to its efficiency for such a purpose.

**DOOR FURNITURE.**—Mr. J. Wilesmith, of Worcester, sends us some specimens of door-plates and door-knobs in which he has employed natural woods only, either plain or with addition of hand carving. The plain ones make very neat-looking furniture; and two of the carved door-plates, oak and ivy, are very nice pieces of work, and look better in the reality than they do in the illustrated catalogue, which is not always the case.

**LONDON STREETS AND BUILDINGS BILL.**—The Select Committee of the House of Commons, presided over by Mr. Stuart Wortley, resumed on Monday the consideration of the Bill promoted by the London County Council to amend and consolidate the Acts relating to London streets and buildings. The Council brought up a clause to enact that all advertisements on the external walls of any buildings should be constructed of fire-resisting materials, and should not cover more than one-fourth of the area of any window. The Committee decided not to insert the clause. Other amendments having been considered, the Committee decided to insert a

clause exempting the buildings in the four Inns of Court from the operations of the Bill.

**THE PROPOSED NILE RESERVOIR.**—In the House of Commons on Tuesday, Sir E. Grey, in reply to Mr. Pierpoint, said that Her Majesty's Government consented at the end of last year to the application of the economies effected by the conversion of the Preference and Daira Sanieh Loans for the construction of a reservoir for the storage of the flood waters of the Nile. The French Government declined to give their consent until they were made acquainted with the amount of the expenditure required. Her Majesty's Government were not aware whether other Governments had yet been consulted. The Egyptian Government were not in a position to furnish the information required, as the Technical Commission appointed to examine the various schemes had not then reported. Their report had not yet been made public, but it was before the Egyptian Government, and a copy was in the possession of Her Majesty's Government. The estimated cost of a reservoir at Assouan, and the works in connexion with it, was, according to that report, between 5,000,000 and 6,000,000.

**KNIGHTHOOD FOR AN ENGINEER.**—Mr. Leader Williams, engineer of the Manchester Ship Canal, has received a communication from Lord Rosebery offering him a knighthood in commemoration of his labours in connection with that undertaking. Mr. Williams is a member of the Institution of Civil Engineers and of the Institute of Mechanical Engineers. He is the eldest son of the late engineer of the Severn Navigation, and received on those works his early professional training, 1844-1850. He was then engaged as a resident engineer in the construction of the Great Northern Railway. Mr. Williams was appointed in 1856 engineer to the Weaver Trust. Before completing his work on the Weaver Mr. Williams received the appointment of engineer to the British India Navigation Company, and the enlargement of the Runcorn Docks was carried out under his direction. On September 26, 1882, his plans for the Ship Canal to Manchester were unanimously adopted by the provisional committee.

**THE BUILDING TRADE IN DUNDEE.**—According to a Dundee paper, the condition and prospects of the building trade in Dundee are at present the reverse of bright. Twelve months ago or less the outlook was promising, several large contracts being then on hand. However, these large works are now finished, and their completion removes practically all the extensive undertakings from the list of local contracts. In the meantime operations are for the most part confined to the erection of dwelling-houses. In fact, there are a fairly large number in hand in different quarters of the city, but especially in the east and the north. While the prospects are not so bright as they were at this time last year, there are in view several large undertakings. Of these the most important is the new Post Office. The erection of which is expected to be in full swing by the time of next year. The new Industrial School for Girls at Balgay will be begun within the next few days. In about a fortnight it is expected that a start will be made with the Smallpox Hospital, and a beginning has already taken place in connexion with the new Baptist church in Ward-road. In addition to these the erection of the Free Library and Public Baths at Loch year will be proceeded with. The number of masons employed is about the average, and the wages remain as they have been for about a year past—namely, 8½d. for builders and 8d. for hewers.

**CHANGE OF ADDRESS.**—Messrs. Clark, Bunnell,

& Co., Limited, engineers and founders, have removed their offices from Rathbone-place, Oxford-street, and 30, King-street, Cheapside, to larger premises, 22, Queen-street, Cheapside.

**PRESERVATION OF INDIAN ART.**—Sir James Linton presided over the annual meeting of the Society for the Encouragement and Preservation of Indian Art, which took place at the Imperial Institute on the 18th inst. Mr. Beechcroft, L.C.C., in moving the adoption of the report, gave the impressions gathered by him during a recent tour in India, as to the existing conditions of manual and technical handicrafts, and regretted the present tendencies of the richer and ruling natives to furnish their houses and palaces from Tottenham-court-road. Sir James Turner, who seconded this, was followed by Mr. F. Fawcett, who proposed a vote of thanks to the executive committee. Lieut.-General Pearce replied. Sir James Linton said, if he were asked what would be best for Indian art, he would counsel a policy of non-interference, except for the preservation of its national characteristics. He could conceive nothing more inimical to its true interests than the well-meant attempt of a gentleman who quite recently sent home a commission to a friend to buy for him in London a number of modern pictures to be used as models by Indian art students. It was only courting disaster to put before them examples, say, of Scotch or English landscapes produced under such differing atmospheric conditions, and instead of fostering native art a mere race of imitators would be thus produced. Sir James quoted Mr. Ruskin in support of an argument that he discussed at some length, that no art could ever be great unless it was essentially national. Colour alone is universal in the language of art, but the standard of form changes with every racial divergence, and it is absurd to insist that what is right with us is alone right for others. It was to prevent this mistake that the society had been founded, and he hoped that it would combat with all its power all attempts to Europeanise the art instincts of our Indian Empire.

## LEGAL.

### ALLEGED INTERFERENCE WITH ANCIENT LIGHTS AT KEIGHLEY.

THE case of Sugden, Keighley & Co., Limited, v. Dixon, came before Mr. Justice Chitty, in the Chancery Division, on Tuesday, Wednesday, Thursday, and Friday last.

The plaintiffs are a limited company, carrying on business as worsted-spinners in a mill situate in Money-street and East Parade, Keighley, Yorkshire, and known as Low-street Mill, and the defendant, Mr. John Dixon, is the owner and occupier of certain lands and premises situate at the rear of and adjoining the plaintiffs' premises on the north-east side, and known as Perseverance Works, he there carrying on the business of a machine maker.

The plaintiffs claimed an injunction and damages from the defendant for alleged interference with their ancient lights. It appeared that the plaintiffs' mill consists of a building in several stories, all of which, including what is known as the yarn-room, are lighted exclusively by windows overlooking the defendant's premises, which are placed parallel with the plaintiffs' premises. These buildings of the defendant's are partly one-story and partly two-story. One portion known as the model-room was destroyed by fire in the course of last year, and opposite to which is the plaintiffs' yarn-room, and on the second story the plaintiffs' twisting-room, each with eleven windows overlooking defendant's premises. The plaintiffs alleged that by reason of defendant's building operations, begun in October, 1893, in the course of which the wall opposite was raised from 11 ft. 4 in. to 18 ft. 3 in., certain intervening gaps being filled in, a number of their (plaintiffs') windows on the ground floor lighting the yarn-room, and which were ancient lights, had been interfered with.

The defence was a general denial of the allegations contained in the statement of claim.

Mr. Farwell, Q.C., and Mr. Bramwell Davies appeared as counsel for the plaintiffs, and Mr. Byrne, Q.C., and Mr. Butcher represented the defendants.

Mr. Farwell, in opening the plaintiffs' case, stated that an interim injunction had been obtained by the plaintiffs on October 17, 1893, in the Vacation Court, while on November 10 of the same year his lordship gave the defendant liberty to proceed to



4,746.—RATCHET-BRACES: *B. Ljungström* (Stockholm).—The braces are made so as to receive a continuous motion when the lever is moved to and fro as usual. This is effected by arranging two toothed wheels on the boring-bar, these both gearing with a third conical toothed wheel. The latter is alternately rotated by means of a lever, and the other wheels then alternately move the boring, there







**LAURENCEKIRK (N.B.)**—For the execution of sewage works.  
Mr. Wm. Boulton, C.E., Union-street, Aberdeen.  
A. M. Ireland ..... £2,500 0 0  
J. Melloy ..... 2,250 17 10  
J. Pine ..... 2,125 15 3  
Gill & Walker ..... 2,143 3 8  
J. Murray ..... 2,125 8 0  
W. Anderson ..... 2,050 10 0  
E. Gauld ..... 2,040 19 1  
R. Gair ..... 2,045 17 10  
A. Leith & Son ..... 2,011 6 5  
Accepted.

**LEAMINGTON**—Accepted for new outbridge and other work, or the Great Western Railway Co. —  
W. Lissaman, Junr. .... £808 13 3

**LONDON**—For designing and fitting up 21, Prince's-street, Oxford-circuit, W. for Messrs. Parke, including electric lighting —  
Munro D. W. & Co., Clapham Junction ..... £4,080  
Accepted.

**LONDON**—Accepted for mahogany fittings, 6, The Broadway, Hammer-smith, W. for Messrs. Parke. —  
Martin L. Wills & Co. .... £455 0 0

**LONDON**—For proposed new staircase, foyer, and entrances to Thornbury Hall, Upper-street, Ilkington, for the proprietors. Mr. George Hall, architect, 513, Holloway-road —  
A. Coomles ..... £240 0 0  
Cannon ..... 455 10 0  
R. Wood ..... 497 0 0  
Stevens Bros. .... 395 0 0  
Accepted.

**LONDON**—Accepted for alterations and additions to 43, Praed-street, Faldington, for Mr. D. Richards. Messrs. Thomas & Taylor, architects. —  
Elkington & Drysdale ..... £225 0 0

**LONDON**—For the erection of buildings for refuse destructor, &c., King's-road station, for the St. Pancras Vestry. Mr. Wm. Nisbet Blair, C.E., Vestry Hall, Pancras-road, London, N.W. Quantities by Mr. W. T. Farthing, 46, Strand —  
H. Wall & Co. .... £5,590  
J. Stead ..... 5,733  
Spencer & Co. .... 5,588  
Kirk & Randall ..... 5,555  
Newman ..... 5,559  
J. O. Richardson, Albert Works, Fockham ..... 5,178  
Accepted.

**LONDON**—For the execution of extensive sewerage works, Strand and Adelphi, for the Vestry of St. Martin-in-the-Fields. Mr. Chas. Mason, Engineer, Town Hall, Charing Cross-road, London, W.C. Quantities by Mr. W. T. Farthing, 46, Strand —  
John Neave ..... £4,420 0 0  
John Band ..... 13,880 0 0  
Abram Kellert ..... 13,433 1 1  
Thomas Adams ..... 13,312 0 0  
Mowlem & Co. .... 12,982 0 0  
Edmund Hys ..... £12,957 0 0  
B. Cooke & Co. .... 11,311 0 0  
Fulham ..... 9,690 16 4  
Accepted.

**LONDON**—Accepted for building St. Anselm's Church and Vicarage, Davies-street, Berkeley-square —  
Walter Holt & Sons, Croydon ..... £30,000 0 0

**LONDON**—For certain painting, whitewashing, cleaning, &c., at the Infirmary, Fulham-road, West Bromwich, for the Guardians of the Poor of the St. George's Union. Mr. H. Saxon Snell, architect, London —  
J. H. Newman ..... £750 0 0  
J. Squires ..... 676 10 0  
J. Credlin ..... 627 10 0  
E. Ambrose ..... 609 0 0  
G. Foxley ..... 600 0 0  
H. Wall & Co. .... £589 0 0  
Lilly & Lilly, 5, Pall Mall ..... 587 0 0  
Accepted.

**LONDON**—For granite paving of the yards of the casual wards at Minnans-street, Chelsea, for the Guardians of Chelsea. Messrs. A. & C. Harston, architects, 15, Leadenhall-street, E.C. —  
Wadey ..... £60 0 0  
Mowlem & Co. .... 60 0 0  
G. & C. Boyer ..... 395 0 0  
Griffiths ..... 370 0 0  
Bradrick & Co. .... 349 15 6  
Accepted.

**LONDON**—For repairs, painting, &c., to Mayfield House, North-Eastern Hospital, St. Ann's-road, N., for the Metropolitan Asylums Board. Messrs. A. & C. Harston, architects, 15, Leadenhall-street, E.C. —  
H. Wall & Co. .... £207 10 0  
Vigor & Co. .... 779 0 0  
Knight, Westminster ..... £257  
Accepted.

**LONDON**—For painting, &c., works at the Infirmary wing of the St. Pancras Workhouse —  
H. W. Harris ..... £2,200 0 0  
A. Green & Co. .... 980 0 0  
Geo. Wiles ..... 700 0 0  
T. W. Castwell ..... 722 4 4  
Danes & Co. .... 698 0 0  
J. Bedford Pucker ..... 665 0 0  
H. Wall & Co. .... 647 0 0  
J. & H. Bays ..... 641 0 0  
William Watts ..... £685 0 0  
Peattie & Axtell ..... 620 0 0  
Stewart & Co. .... 616 17 4  
Marchant & Hunt ..... 510 0 0  
Henry King ..... 500 0 0  
Thomas Bennett ..... 495 0 0  
J. Riley (accepted) ..... 482 0 0

**SOUTHAMPTON**—For the erection of engine-house, conductions, &c., Otterbourne pumping-station, for the Corporation. Mr. W. Matthews, Waterworks Engineer, Southampton. Quantities by Mr. E. C. Poole, Southampton —  
Playfair & Toole ..... £3,700  
A. Simonds ..... 3,530  
H. Bull, Southampton ..... £3,093  
Accepted.

**STAFFORD**—For the provision of materials and construction of about twenty-three miles of drains, for the Corporation. Mr. W. Blackshaw, Borough Surveyor, Borough Hall, Stafford —  
Tomlinson ..... £36,336 6 11  
Kotter ..... 24,450 0 0  
Carrall & Lewis ..... 20,926 0 0  
Keelett ..... 27,385 0 0  
Nadin ..... 26,263 0 0  
Neave ..... 25,750 0 0  
Santon ..... 25,641 0 0  
Earl & Briggs ..... 25,093 4 7  
Nevitt ..... 24,600 7 11  
Jones & Fitzmaurice ..... 24,150 0 0  
S. E. Bentley ..... £24,102 0 0  
Thomson ..... 24,039 0 0  
Pillbury ..... 24,000 0 0  
Holloway ..... 23,129 17 0  
Newell ..... 22,800 0 0  
Dykeson ..... 21,344 15 1  
Temple ..... 21,300 0 0  
Bower ..... 21,229 15 0  
Bark ..... 19,705 0 0

**ST. ANNES-ON-THA-SEA**—For new infectious hospital for the St. Annes-on-the-Sea Local Board. Mr. J. Wardle-Bulcock, architect, St. Annes —  
W. Woodcock ..... £2,000 0 0  
J. Shepherd & Sons ..... £1,750 0 0  
W. Cookson ..... 726 0 0  
Accepted.  
[Architect's estimate, £754.]

**ST. ANNES-ON-THA-SEA**—For six abattoirs, or the St. Annes-on-the-Sea Local Board. Mr. J. Wardle-Bulcock, architect, St. Annes —  
Design No. 1.  
W. Woodcock ..... £1,570 0 0  
J. Shepherd & Sons ..... £1,145 0 0  
W. Cookson (accepted) ..... £1,000 0 0  
Accepted.  
[Architect's estimate, £1,041.]

Design No. 2.  
J. Shepherd & Sons ..... £1,797 0 0  
S. Wilson ..... 750 16 10  
W. Cookson ..... £1,756 0 0  
Accepted.  
[Architect's estimate, £802.]

**TONDU**—Accepted for new passenger station, platforms, and other work, for the Great Western Railway Co. —  
W. Lissaman, Junr. .... £5,000 0 0

**TONYPANDY (S. Wales)**—For the erection of school buildings, for the Ystradgynod School Board. Mr. J. Rex, architect, Hillside Cottage, Penrhy, Glam. —  
A. Richards ..... £7,045  
D. Evans & Son ..... 6,500  
C. Jenkins & Son ..... 6,540  
Morgan & Williams ..... £6,500  
Tonypandy ..... 5,860  
Accepted.

**TOTTINGHAM**—Accepted at schedule of prices for the construction of reservoir, and enlarging present reservoir, for Mr. R. K. Roberts. Mr. Thos. Nuttall, C.E., 12, Market-street, Bury —  
Chas. Lomax, Summerseat.

**TOXTETH PARK (Lancs.)**—For the reconstruction of part of Smithdown-road, for the Local Board. Mr. Geo. Price, C.E., Public Offices, Wash-line, Toxteth Park, Liverpool —  
W. F. Chadwick ..... £1,166 13 6

**WEST BRIDGFORD (Notts.)**—For the erection of school buildings, Muster's- and George-road, for the School Board, Mr. Fredk. Hall, architect, 5, Round-gate, Nottingham. Quantities by the architect —  
B. Keeling ..... £5,389 13 0  
W. Donnelly ..... 5,375 10 0  
T. Culbert ..... 5,554 0 0  
W. Youngman ..... 5,501 0 0  
F. Lee ..... 5,500 0 0  
W. E. Shaw ..... 5,460 0 0  
Hodson & Son ..... 5,490 0 0  
T. Barlow ..... 5,462 0 0  
J. Musson ..... 5,475 0 0  
G. Gilbert & Co. .... 5,400 0 0  
H. Scott & Son ..... 5,350 0 0  
J. H. Vickers ..... 5,330 0 0  
W. Savage ..... £5,337 0 0  
S. A. Bell ..... 5,320 0 0  
J. H. Vickers ..... 5,300 0 0  
J. Wright ..... 5,295 0 0  
J. Thomas ..... 5,275 0 0  
W. M. Mule ..... 5,270 0 0  
J. Hinchinson ..... 5,230 0 0  
T. Whittaker ..... 5,195 0 0  
John Corbett, Talbot Street, Nottingham ..... £,730 0 0  
Dennett & Ingell ..... 5,040 0 0  
Accepted.  
\* Withdrawn.

**Corrections**—We are asked to state that the name Simpson & Son printed in our issue for the 9th inst. in a list of tenders for work at "Alexandra Park Tavern," Wood Green, and the "Coach and Horses," Walthamstow, respectively, should have been Simpson & Cove.

## TO CORRESPONDENTS.

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# The Builder.

VOL. LXVI. NO. 283.

JUNE 19, 1894.

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### The Tower Bridge.



HE ceremonial opening of the Tower Bridge by the Prince and Princess of Wales, to take place to-day (Saturday) will mark the successful completion of what in a purely engineering sense is one of the most important among modern structures. A bridge across the Thames is not in itself an immense undertaking; the *crux* lay in the effort to produce a bridge which would reconcile the opposing claims of land and water traffic. Various schemes were proposed, when the subject was first considered, for effecting this object. One of the most remarkable was Mr. Barclay Bruce's design for a rolling bridge, to rest only on three piers at a time, and to be propelled across the tops of the piers from side to side of the river, leaving always nearly two-thirds of the water-way open. This original suggestion would have had a good many conveniences to recommend it, but the cost of working it would have been considerable and the wear and tear of parts considerable, whilst it had the additional disadvantage of requiring no fewer than six built piers in the waterway. Other designs were suggested by two or three engineers, on the principle of a bridge which should have a double crossing road, one of the two to be always open, one branch being opened for a vessel to enter the space between them, and closed before the other branch was opened, so that passengers across the bridge would at any moment find a continuous roadway open to them across one branch or the other. All the schemes of this class appear however to have been devised by people who had entirely failed to realise the difficulty of dealing with shipping in a strong tide-way, and who seem to have regarded a vessel on the water as a thing that can be pulled up and kept standing quietly at any chosen point, like a horse and carriage. The experiences they would have had of the actual working of any such scheme would probably have surprised them a good deal. Another principle proposed was that of a continuous high-level bridge with gradient approaches; but it may be doubted whether

much of the ordinary wheeled traffic would have made use of the bridge under the drawback of such an expenditure of labour in mounting to it and descending from it. In short, the difficulty of providing for uninterrupted traffic both for land and river has been seen to be insuperable, and the present bridge has been constructed on the only rational principle—that of allowing uninterrupted passage to the river traffic, and making the land traffic wait whenever necessary. This is what it practically comes to. The low-level bridge bars the river for all large vessels as long as it is down, but it can be raised on a signal from a distance, and if a steamer has to slacken speed for a moment to allow time for the lifting of the bridge, that is a very different thing from the impossible scheme of attempting to detain it in a narrow space between two bridges, which the proponents of the double-bridge schemes contemplated. On the other hand, wheeled traffic on the roads will have before it a low-level roadway, presenting no difficulty of access on either side, and liable only to occasional interruptions of a few minutes at a time. These interruptions, it must be admitted, will probably be pretty numerous during the day, and it remains to be seen what will really be the practical value of this opening and shutting roadway for accommodating wheeled traffic; but it is probable that it will prove to be a very important convenience for goods traffic (more especially) between the two banks of the river; and at all events it is the only principle on which the compromise could have been effected. Meanwhile the pedestrian has an absolutely uninterrupted road provided for him along the high level bridge, to be reached either by lifts or stairs. We regard this as one of the most important features in the bridge, as it provides for uninterrupted communication in at least one form, and for those who are not infirm or aged there is really no necessity for even the delay of waiting for the lift, as the climb up the stairs is nothing very formidable, and the stair is a very good and commodious one.

We may consider the bridge therefore as having achieved its practical object in as satisfactory a manner as was possible, having regard to all the conflicting interests to be provided for; and if it were a utilitarian structure merely there would only be room

for congratulation on the admirable manner in which the work has been carried out as far as its purely engineering and structural arrangements are concerned. Unfortunately it is impossible to consider it only in this light, as its projectors have chosen to clothe it with an architectural garb and to make an appeal for admiration for it as an architectural structure; and in this sense it is one of the worst and most ludicrous failures we know of.

In the *Builder* for July 3, 1886, we published a view of the bridge as originally designed by Sir Horace Jones, in conjunction with Mr. J. Wolfe Barry, the engineer. That drawing, however, may be regarded as mainly the architectural conception of the bridge; the picturesque view of its intended appearance; as engineering details hardly came into it at all. In that drawing the design of the large towers was at all events much superior to their design as now carried out. The late Sir Horace Jones, though hardly what would now be called an "art architect," had a good deal more perception as to the artistic element in architectural design than would be quite realised by those who knew him only as the architect of the City markets. His design for the towers was a simple and somewhat impressive one, with a corbelled-out upper story and angle-turrets somewhat after the manner of Scotch Castellated Gothic, and a band of panelling a little way below them, the rest of the tower being very simply treated. As we said at the time, it would have been better had it been still more simple, and had some of the windows and other ornamental features been omitted; but still it was in that form a fairly good design. Such merit as it had it has now entirely lost. The proportion of the whole has been entirely spoiled by bringing down the angle-turrets a great deal lower, nearly half-way down the tower in fact, thus completely destroying their expression as marking a massive crowning story. The method of corbelling them out also has been altered, and entirely weakened and spoiled, while instead of the architect's original single band of wall-panelling the tower is surrounded with a series of horizontal bands at equal distances. This is the engineer's improvement on the architect's design, we presume, the result of which has been to deprive it of any good qualities which it had in its



original form. The sides of the towers are pierced with a number of windows that light nothing, with gewgaw "Gothic" decorations, some portion of these may have been the City Architect's fault, though as far as we can make out there was hardly so much of this unmeaning window decoration on the original design. At all events, as they stand at present, the towers are about as choice specimens of architectural gimcrack on a large scale as one could wish to see.

This is the smallest part of the matter, however. Sir Horace Jones's original design was, it must be admitted, an acceptance of the absurdity that architectural structures in masonry were to be used to conceal the iron-work, and to have the appearance of carrying immense suspension chains which they could not possibly carry. In this sense the design was vicious from the first. The stone gateway of approach to the bridge is a good design in itself, but it is entirely unlifted and rendered absurd by the sight of the immense chains which are made to seem as if hanging over it and rove through openings in the masonry, though we knew perfectly well that the masonry which is made to appear to carry them would be dragged to pieces even by such movements of the chain as might be caused by expansion and contraction of the metal. By a similar absurdity, the upper ends of the chains are made to appear as if supported by the large towers. It might be thought that architectural shamming could hardly go farther than this; but the engineer of the bridge has contrived to distance even this. Although the masonry towers are only envelopes, and could not possibly carry the chains which appear to be suspended across them, they have at least the aspect of being solidly built towers founded on the piers which carry the bridge. But even this is a delusion. Will it be credited that these masonry towers are actually built on and carried by the iron-work; their side walls have no foundations at all, they are slung, as it were, in gigantic stirrups of steel, and at the period of our visit to the works you could actually look under the base of the walls into a vacant space above which they were hanging. What will be the ultimate result on the masonry of thus depending on a large steel structure which must be subject to constant movement, future years will have to show. What strikes one at present is that the whole structure is the most monstrous and preposterous architectural sham that we have ever known of, and is in that sense a discredit to the generation which has erected it. Far better would it have been to have built simply the naked steel-work, and let the construction show us what it really is; the effect, if somewhat bare-looking, would have been at least honest, and we should have been relieved from the spectacle of many thousands spent on what is not the bridge at all—what is no part of its structure—but an elaborate and costly make-believe.

Under these circumstances we decline to waste any plates in giving illustrations of the so-called architecture of the Tower Bridge, but we give measured drawings of the only part of the structure that is worth anything, viz., the constructive steel-work (as it should be called rather than iron-work); a side elevation of the whole structure, and a section of one leaf of the lifting or bascule bridge with the chamber in which the heel of it descends when the bridge is open.

In regard to the general design, it should be mentioned that this is really a double cantilever, the suspension chains of each of the end portions being connected by the structure of the permanent high-level bridge, which is in fact a tension-bar uniting the chains.

The two main piers had to be carried on at successive periods, as their simultaneous building would have rendered it impossible to keep the amount of waterway clear which was required from the contractors. The foundations formed in the caissons were of concrete of six of Thames ballast to one of

Portland cement, shot in without any adherence to regular layers. The piers from the river bed upwards are faced with rough-picked Cornish granite, and the interior work built with wire-cut Gault brick, except where special strength was required, where Staffordshire brindle bricks were used; the whole in Portland cement mortar.

Sir William Arrol & Co. were the contractors for the erection of the steel work, which was supplied by the Steel Co. of Scotland, and by some Glasgow firms. The construction of the main piers and of the bascule leaves will be sufficiently evident from the drawings. The bascule leaves are balanced on their centres, a great amount of lead having been used as dead weight in the short arms, and there is therefore practically no weight to lift in raising them—there is only the *vis inertia* and wind-pressure to be overcome. The moving power is applied, as indicated in the section, by small toothed wheels working on the racks of the large quadrants. The power consists of hydraulic engines supplied with water from pumping engines and accumulators on the shore; and everything connected with this part of the work is in duplicate, so that there can be no danger of a breakdown from any temporary derangement of the machinery. The hydraulic engines are constructed by Sir W. G. Armstrong, Mitchell & Co.

The masonry contract, and also the roadway approaches, were carried out by Messrs. Perry & Co., the materials used in the construction of the towers being Cornish granite, Portland stone, and brickwork. There have been a good many minor contracts in connexion with the bridge. The ornamental cast-iron work and decorative panels for the high level footways were made by Messrs. Fullarton, Hodgart, & Barclay, of Paisley. Victoria stone has been used in the paving of the sidewalks of the bridge. The stairs in the towers are laid with Mason's "unwearable" non-slipping treads. The roadway over the moving portions was formed with a bed of creosoted Memel timber laid on the steel plates, 2-in. Greenheart planks over this, and on this, wood-paving blocks laid by the Acme Flooring Company on Mr. Duffy's improved system of banding together the blocks by key-pieces and pins, inserted into cavities in the blocks, and holding the whole together as a compact mass. Messrs. Saxby & Farmer have carried out the signals for showing when the bridge is open. The Eddystone granite quarries supplied the granite, which was worked to a great extent by Brunton & Trier's surfacing-machines for the plain work, and their turning-machines for circular and moulded work. The carving has been carried out by Messrs. Mabey & Son.

The bridge is lighted entirely by gas, and the lighting has been carried out by Messrs. W. Sugg & Co., with their high-power hexagonal gas-lamps on the approaches, the opening span being lighted by four lamps of special construction each of 400-candle power. The columns and brackets for the lamps have been cast to special designs made by Mr. G. D. Stevenson, A.R.I.B.A. Messrs. Sugg have also carried out the work of running the water mains and supplies, and fixing hydrants, tanks, and handpumps in connexion with them, during the progress of the works.

The engineer is Mr. J. Wolfe Barry, whom we may congratulate on the excellent carrying out of all the practical portion of what is essentially a great engineering work. So far it is a success; it is in attempting to make it an architectural work also that he has so lamentably failed.

REMOVALS.—Messrs. Winfields, Limited, art metal workers, &c., have removed their London sample-room from 49, Farringdon-street, to No. 39, Snow Hill, E.C., opposite. Their London business will continue to be under the direction of Mr. Sayer. Messrs. Callender & Co., the large manufacturers of plaster of Paris and Keene's cement, have removed to new premises at 32, St. Mary Axe.

## SCULPTURE AT THE ROYAL ACADEMY.

NEXT to Mr. Fehr's "Perseus and Andromeda," which is a bronze replica of the plaster group on which we commented last year, perhaps the most important, at all events the most exceptional work of the year, is Mr. Gilbert's sketch model for the tomb of the Duke of Clarence, for the Memorial Chapel Windsor. This has been placed a little too high, so that the recumbent figure can hardly be seen, and the spectator has the impression—which may be the correct one—that the artist has been more occupied with the surroundings of the tomb than with the monumental effigy itself. At all events, the gilded railing round the tomb is a grand piece of metal-work design, to which the most brilliant days of the Italian Renaissance could hardly show anything superior. It is divided into compartments by large and solidly-designed standards, and in each compartment hover two angels facing each other and crossing hands, while their pierced wings, one pair lowered and the other raised, form the filling up of the spaces between the standards. The draperies of the angels are coloured. As sketched in the model, the wings look too heavy and massive for the angelic figures, the wings appear to carry the figures rather than the figures carrying the wings; but in the full-size working out this would probably all be modified. Above each group of angels, and as if supported by them, are brackets carrying historic figures, and between these are armorial bearings and escutcheons, modelled with great boldness and partially coloured. If this work is carried out in a manner worthy of the original conception, people in future generations will go to see and sketch it as they now go to see the metal work of the tombs of the Scaligers. The kneeling angel at the head of the recumbent figure, with wings outstretched and holding out a crown over it, is also a very fine conception.

Besides Mr. Fehr's group, there are two other bronze replicas of important works before exhibited, in plaster. One is Mr. Thornycroft's "Mower," which reappears after many years, and still divides one's judgment between admiration for the simplicity and native dignity of the figure, and the feeling that such details as heavy laced-boots are out of place in sculpture. The other is Mr. Drury's "Circe," of which we gave an illustration in its plaster form last year; it improves in bronze, and is a very spirited and individual work, but not Circe; the figure is that of a modern woman, both in physique and expression. Mr. Mackenall's "Circe," which was last year at the Salon, and is now in the Lecture Room at the Academy, is a far more ideal conception, as she stands with her outstretched hands turned downward, as if casting a spell over something; round the base is a small bas-relief of figures, symbolical of the brutalising influence of her spell, which, for some strange freak of prudery, the Academy authorities have had covered up! We give an illustration of the work. The other figures which occupy, as usual, the corner spaces of the Lecture Room, are Mr. Lucchesi's "A Vanishing Dream," of which we gave an illustration in our issue of May 19, 1894; Mr. W. Goscombe John's "St. John the Baptist," of which we gave an illustration in this number; and Mr. C. J. Allan's "Perseus Returning Victorious to the Gods." This latter is a well-modelled nude figure, but there is a kind of swagger about it which suggests a champion of the arena rather than a victorious immortal. Mr. Lucchesi's "Vanishing Dream" is a rather curious conception, and it is not quite easy to see the precise point of it. Is she a slave, that her hands are tied behind her with very realistic rope? Or is the cord and the binding of the hands only a kind of symbol? What is obvious is that the figure is a very pretty and delicately-



modelled one, and the face very sensitive and pathetic in expression, and the sculptor has succeeded in conveying this expression without overstepping the reserve proper to sculpture. Mr. Goscombe John's "John the Baptist" suggests rather the half-savage life than the prophetic dignity and inspiration of the Forerunner; we prefer his nude figure entitled "Morpheus," which is placed in the central hall, both a fine figure and a good conception of an abstract ideal.

In the central hall is also Mr. Adrian Jones's spirited life-size equestrian group of the "Rape of the Sabines," which might better have had some more general title, such as "Marriage by Capture," as the idea of a nude Roman man and Sabine woman under the circumstances (the ladies, according to the legend, having been taken by surprise at a public festival to which the Romans were invited) is, of course, absurd. The rather stiff appearance and action of the hind legs of the horse is perhaps justifiable under the idea that he is rearing with some difficulty under the unusual weight of two people. Among the other ideal works in the central hall Mr. Montford's "Spinning Girl" is a prettily-designed figure. There are four editions of "Irene and her Attendants Taking Down the Body of St. Sebastian," from the recent students' competition, of which the most sculpturesque in composition and treatment is that of Mr. Thomas. Some of the groups fail in realising the exertion which a couple of women must make in holding the weight of a dead body and taking it down from a vertical position; in No. 1,743 they are really hardly doing any work at all over it, and could not have supported the weight in the position and with the feeble action of the hands that is shown. The Countess Gleichen gives the title of "Satan" to an armed figure in bronze, on a small scale, with a dejected expression of countenance, seated on a throne executed in marble and placed on a marble base. It is a very well-executed little work, but one is perhaps more struck with the decorative effect of the two materials and the clever way in which they are combined, than with the sculpturesque conception of the work.

Among the ideal subjects of the collection are Mr. Schenck's two reliefs which were illustrated in our last issue, of which we prefer the figure representing Night; the other one is a fine and expressive figure in the upper portion, but the crossed feet look rather awkward and seem at variance with the spirit of life and free movement which should belong to a figure representing Dawn. These are, however, the best reliefs of the year. "The Landing of James Riebeck at the Cape," by Mr. Tweed, is too realistic a subject for relief sculpture, a form of art which is peculiarly suited for the expression of abstract and poetic ideals. In this sense it has been used by Mr. G. Frampton in the low-relief panel entitled "My Thoughts are My Children," a work to which the only objection is perhaps that it rather fails in beauty of line, in sculpturesque quality. A small bas-relief bust by Miss Ida Matton, "Sleep," deserves notice as a very successful rendering of the expression of sleep, and also as a piece of broad style of execution, in which the surface of the marble has been too much worked upon, but is left with the touch of the chisel on it.

Among monumental or portrait statues Mr. Onslow Ford's figure of Mr. Gladstone, in the central hall, is as successful as a bronze statue in modern dress can be; the sculptor has made the most of the frock-coat as a substitute for the freedom of drapery, and avoided formality in the treatment of its lines; and the attitude of the figure, as if in the act of speaking and emphasising a "point" by the action of the right hand, with the finger extended, is very expressive. Mr. Armstead's recumbent figure of Lord Wimmarleigh, to be placed in the church at Warrington, is a fine example of this class of work. Among portrait figures also should be mentioned

Mr. Chevaulland's very spirited and well-modelled figure of a little boy in a fishing costume, under the title "The Shrimper."

Among portrait busts there are one or two very beautiful things. We presume that we may include among portraits the delicate and highly-finished "study of a head" by Mr. Onslow Ford, certainly one of the best works of the year. "The Lady Lucy Drury-Lowe and children," by Mr. Lanteri, is a marble bust of a fine and very dignified character, around the base of which are affixed seven small bronze medallions with profile portraits of the lady's children; a pretty and novel idea. Mr. Williamson's bust of Lord Tennyson is a fine one, and conveys very well the grave and rather heroic character of the poet's head as it was familiar to many during his later years. There are other portrait busts not far from these two which represent the kind of head that ought not to be treated in sculpture, and stand as warnings both to sculptor and sitter that a man may be a very worthy and excellent member of society without presenting any physical characteristics which would justify him in having himself commemorated in marble. Among professedly ideal heads we have published an illustration of one of the best in the exhibition, Mr. Drury's "St. Agnes" (see *Builder* of May 19), in which there is a beauty and intensity of expression very unusual. Miss Emmeline Halse's head in relief, of a little child, under the title "Naughty" (published in the *Builder* of the same date as the last-named) is a charming little bit of child-character.

Among the smaller things in the exhibition are two studies of figures on a small scale which are included in our illustration this week, Mr. Mullins's "Boy with peg-top" and Mr. Natorp's bronze statuette of a woman under the title "Knuckle-bones." These are appropriately placed as pendants, each of them being a study of the nude figure with a little incident to give point to it. Two designs for door-knockers, one by Mr. A. R. Lewis, the other by Mr. C. T. Allen, subject "Fortuna," are of interest; the first one is a very pretty piece of design, but has the defect which we often find in door-knockers, ancient and modern, of the Renaissance type, that it does not appear as if specially designed for the purpose of knocking. In Mr. Allen's design, which is included among our illustrations, the rim of the wheel on which the "Fortuna" is seated acts as the knocker. The figures at the sides are very graceful, and the attachment to the door is specially marked in the design, though it is a little too Gothic in character to harmonise with the other portions.

Among the examples of animal sculpture is a fine relief by Mr. J. H. M. Furse of a lioness and cub, which is to a certain extent conventionalised in treatment and yet full of life and vigour, reminding one rather of Greek work. A group of cats by Miss Chaplin, and a small bronze study of a lion shot with an arrow, "The Dying Kings," by Mr. Briton Riviere, are worth attention.

The only work among our illustrations which is not in the Royal Academy is Mr. Lucchesi's expressive work, figure of "Oblivion," which is in the New Gallery, but is a reproduction in bronze of a work which was in the Royal Academy last year.

**SOCIETY OF ARTS.**—The one-hundred-and-fortieth annual meeting of the Society of Arts was held on the 27th inst., Sir Henry Doulton, Vice-President of the Society, in the chair. The principal business of the meeting was the reading of the annual report, and the election of the new Council for the year 1894-5. The Prince of Wales was re-elected to the Presidency, which office he has filled since 1864. The new Vice-Presidents elected were H.R.H. the Duke of York, the Earl of Rosebery, Lord Halsbury, and Sir Courtenay Boyle; the new members of Council were Captain Abney, Mr. Wolfe Barry, Lord Belhaven, and Mr. A. Siemens. The report, which was read by the Secretary, Sir Henry Wood, summarised the work of the Society for the past year, and referred specially to the Chicago Exhibition, for which the Council of the Society had acted as a Royal Commission.

## NOTES.



OUR attention has been called to the result of the competition for Winwick Asylum (given under the head of "Competitions" in another column), which is, we believe, the sixth large competition of this kind in which Mr. Howell has been the assessor and Messrs. Giles, Gough, & Trollope, and Mr. G. T. Hine have received respectively the two first premiums. If this system of engaging one gentleman as assessor over and over again for the same class of buildings is persisted in, it will obviously be useless for any architects except the favoured two to go in for any such competitions. We do not impute any unfairness whatever; as we have before said, if an assessor has any belief in his own views about planning a special class of building, he must necessarily select the designs which fall in with his views. But the obvious result is, when A is always assessor, and B and C always send in plans in accordance with his theories, that the result of each competition is a foregone conclusion; the committees or boards for whom the asylums are built (and who represent the public interest) are tied down to one form of plan, and precluded from getting any new ideas by other architects which may be of value, and can obtain only plans by B or C, expanded in infinite series. Another and perhaps even worse result is that under such circumstances architects are tempted to aim, not at making the best design in the abstract, according to their own ideas, but the one which will be likely to meet the views of the special assessor engaged. The assessor system has been productive of a great deal of improvement in the conduct of competitions, but this is one of the defects to which it is subject, and which the promoters of competitions ought to be on their guard against. In regard to the special case referred to, we certainly think it is desirable that Mr. Howell should be permitted to rest on his laurels as an assessor of asylum competitions, and that a chance should be given for some other expert in asylum planning to have an opportunity of considering the suggestions of architects competing for the building of new asylums.

THE Railway and Canal Traffic Bill passed the second reading on Friday last, after a postponement necessitated by opposition at the first attempt earlier in the week. Mr. Bryce undertook to give every facility for discussion in Committee, and had the support of an ex-President of the Board of Trade, and also of members representing various interested parties, in his appeal to objectors to withdraw their opposition. It has been stated that Mr. Mundella intended the Bill to go to the Standing Committee on Trade; but it appears probable that it will be discussed in Committee of the whole House when public business permits. All sorts of disputes are being kept in obedience pending the passing of this measure, although it is quite likely that many of the matters thus brought to a standstill will not be affected by its provisions. Consequently the railway companies, no less than the traders, are anxious to avoid any further delay; or there would have been more difficulty in overcoming the opposition to the second reading.

ARCHITECTS attracted to Budapest by the Hygienic Congress will be surprised at the building activity shown in this city. Budapest has been constantly modernised from year to year during the last decade, and there is apparently no abatement in the desire of the Hungarians to make their capital a second Vienna as far as architecture is concerned. It is rather unusual to find oneself in a city where no less than six large covered markets are being taken in hand at one time, and where the list of new churches



can boast of such examples as the Leopold Church, which is now nearing its completion. The new Houses of Parliament are the most important of the buildings now being covered in, whilst of the other public buildings in progress barracks and hospitals figure most conspicuously. Private enterprise includes large blocks like the new Equitable Insurance Company's offices and an extensive bazaar. Of engineering works the two Danube bridges are to be taken in hand at once and the new Metropolitan Railway soon after; in fact, with a few exceptions everything a modern city requires is to be provided for before 1900. Even a national exhibition is being prepared for 1896, and its grounds are already being laid out. It is to be hoped that the Hygienic Congress will also exercise some influence on the sanitary and scavenging arrangements of the city, which, in some quarters at least, are by no means up to date.

LAST week London again had one of its great fires. The whole of the available force of the Fire Brigade was in attendance, and, as usual, the rest of the Metropolis had for the time being to be left unprotected. There were no interesting features about the fire from a technical point of view, but it certainly again afforded us a most striking proof of the necessity of soon having adequate preventive legislation and a stronger fire department. On Tuesday, coincidence gave the Parliamentary Select Committee on the Streets and Building Act an opportunity to improve on our preventive regulations as far as the divisions of fire-risks by party-walls is concerned, but unfortunately the Architectural Association, of all bodies, actually tried to induce the committee to advise the omission of an old clause requiring walls between dwelling-houses to be carried above the roof. Party walls were only to be carried up to below the roof covering, and the tiles or slates bedded in them. Of course protruding party-walls are no ornament, though if properly treated they need not be an eyesore; they may, indeed, be an appropriate feature to mark the division between two tenements. It is an architect's duty to adapt his design to practical necessities, and Sir Eyre M. Shaw's and Mr. Simond's evidence, combined with the gist of every foreign building act, are convincing enough, and Liverpool's omission, in this case, of little count. The committee was wise enough to see this, and let the old clause stand.

WE print among our correspondence a long letter from Mr. Read, the City Surveyor of Glasgow, setting forth more at length his views as to the objections to the employment of intercepting traps on house drains, and the desirability of running the drains open from the sewer to the water-closet trap. We have given attention to his reasoning, which we do not find conclusive; and although we are ready to give every weight to the seriously-expressed conclusions of a city surveyor of some experience who takes a great interest in his work, and glad to give him space to express his conclusions fully, it will require much more evidence than we at present see to persuade us to concur with him. Our opinion still is that to connect all the dwelling-houses in a town directly with the common sewer, with no break except the ordinary water-closet trap, liable from so many causes to be temporarily ineffective, would be a very great danger, and we hope none of our readers will be led by Mr. Read's eloquence into any hasty putting of his theories into practice. As to the argument that the ventilation of the sewer is the personal duty of each householder, as the sewer is partly for his benefit, that is perfectly absurd. He might just as well argue that the cleansing of the streets was the personal duty of each householder.

THE case of Jolliffe v. Woodhouse, decided last week by the Court of Appeal, and reported on another page in our current issue, places some parts of the law in regard to party-walls on a clear footing. There is no doubt that an owner of a party-wall may rebuild it, but he is under an obligation towards the other owner to do so in a reasonable time. In the present case the time taken over pulling down the wall and rebuilding it was from February to August, and for the delay, which was held to be unreasonable, the person who pulled down the wall had to pay 40*l.* damages to the other owner of the wall. Then it was contended on behalf of the building owner that the delay was that of the builder or architect, and that he was not responsible for this. But the Court of Appeal decided otherwise, on the ground that to employ a competent builder or architect did not divest the owner of the party-wall from the obligation under which he lay to the other owner. It is clear, therefore, that an owner of a party-wall, who is about to do work upon it, must, in order to safeguard himself, obtain from his builder or his architect a guarantee that they will be responsible for any loss which may be incurred through their acts. He will not be protected from an action by the co-owner merely by saying that he has done his best, has put the work into the hands of a competent builder, under the superintendence of a competent architect. Both builder and architect have also to remember that, to use the words of Lord Justice Lindley, the work must be done "with reasonable despatch," otherwise the co-owner has a right to damages.

IN reference to the dispute as to the London County Council and non-union artisans, concerning which there have been letters in our columns this week and last, we have received from the "National Free Labour Association" a number of statements of different artisans on the subject. We give two or three of these as samples, suppressing the names, as the men might be inconvenienced otherwise:—

"I went to the Westminster Bridge job with a non-unionist painter. The foreman inquired if we were union men, and on our both answering no, said that he could not take us on, as they employed none but union men there. About a quarter of an hour afterwards he took on two union men for the job.

At the Fire Brigade Station job I applied with a union man who had a federation ticket. The foreman asked why I did not belong to the union, and said that they employed none but union men there. The other man was taken on and I was refused, and an hour afterwards I saw a union man taken on, so that I know if I had had a federation ticket I should have got the job."

"I am a painter, and in September last (about) I applied at Spring Gardens, where the Works Department were doing the painting. I asked the foreman (W. Owen) for a job. He asked if I was a society man. On my answering no, he said he could not give me a job. He afterwards took on several union men on the same job."

"About February, 1893, I applied for employment at the London County Council works, Victoria Park (fitting up gymnasium and shelter, Hackney Wick). The foreman of the works asked me if I had a ticket. I told him I had an old one; he said that won't do, you must have one for this quarter. I cannot employ you."

We have a number more such statements in writing, signed and countersigned by witnesses. Unless one is to believe that they are all fabrications, it is obvious that the complaint of non-unionist men against the County Council officials is not without foundation.

THE monthly return of Mr. Sylvanus Trevail, Chairman of the Sanitary Committee of the Cornwall County Council, contains the following drastic remarks on the progress, or want of progress, in sanitary

matters in that part of the world:—"A new water supply has been brought to St. Columb at the instigation of the inhabitants, who may be congratulated upon the result of their agitation. Active steps have been taken at Launceston by the municipal authority with the same object in view, but matters appear to be at a dead-lock for want of official sanction from Whitehall to the proposed loan. At Newquay, the proposed new works moves slowly along, and but for the increased rainfall, the water company would probably ere this have been in as great straits as last year. At Phillack no steps are being taken to remedy the defective water supply. At Porthleven the defective drainage remains just as it was when Dr. Permewan reported upon the insanitary condition of the place. The Helston Rural Authority invited engineers to tender for making survey and supplying plans, and when these were before them, decided upon doing nothing. The Truro Urban Sanitary Authority appears bent on following the example set by the Helston Board of Guardians. Plans were invited in competition for the main drainage of the city in December, 1893. These were prepared with great care, and submitted by four engineers at Lady-day last, but up to the present do not appear to have been seriously discussed by the Town Council. One generation has passed away since a Government Inspector reported that it was absolutely necessary that something should be done speedily to divert the sewage from the Truro river. To-day the volume of filth thrown into it has largely increased, but so far as remedial measures are concerned, the place is no further forward now than it was in 1875. At the present rate of progress another generation is likely to take its departure before anything tangible is done. If the County Council were to give a prize out of the Technical Fund to Cornish Sanitary Authorities that could best 'demonstrate' how 'not to do it,' the competition would certainly be keen just now between Truro, Helston, and Phillack; whilst Penryn, with its forgotten drainage scheme, would make a good fourth."

THE case of Gordon v. the Kensington Vestry, though interesting in itself, does not appear to decide a new point of law. It came before a Divisional Court of the Queen's Bench Division on Monday last, in the form of an application for an injunction to prevent the above Vestry from taking a part only of a public-house in the High-street. It was contended on behalf of the owners that part only of a house could not be taken; it must be all or none. But the Court decided that they had not sufficient facts to enable them to decide if in truth that part which was to be taken could be regarded as an integral portion of the house. The view taken by the Court was that, if the removal of a piece essentially altered that which was kept, then that there would be a taking of a portion of a house so as to oblige the Local Authority to take the whole. If, on the other hand, to quote from Mr. Justice Cave's judgment, "there was a projecting erection placed on a house for ornamental purposes, and if the effect of removing it would be to leave the house substantially as it was before, the removal might be enforced." This put the matter in a nutshell, and reduces this case and similar ones to a simple question of fact, namely, whether the part which the authority desire to take can be removed without really altering the actual structure of the premises.

DURING the week an exhibition of paintings, drawings, and handicraft-work has been held at the rooms of the Royal Society of Artists, at Birmingham. The exhibitors are the members of the "Society of the Quest"—a local artists' fraternity—and the Birmingham Guild of



Handicraft. The well-designed poster announcing the exhibition, and the equally attractive catalogue cover, both by Mr. Sidney Meteyard, raise expectations which are not disappointed by the exhibition itself. The metal-work, chiefly designed by Mr. A. S. Dixon, and executed by the Guild of Handicraft, and including hanging lamps, sconces, bowls, chandelier and finger plates, and other door and cabinet fittings, in brass and copper, as well as a chalice and drinking-cup in hammered silver, is throughout marked with refined treatment and thorough appreciation of the properties of the metals, and is diametrically opposed to that class of work which in the past has been styled "Brummagem." The handicraft work also includes oak chairs and tables of simple and good design, bookbinding and leather work by Miss Pumpfrey, and carved oak panels by Miss Thompson. A number of designs in black and white, for which the Birmingham Art School has more than once received commendation, are here exhibited by Messrs. A. J. Gaskin, C. M. Gere, Sidney Meteyard, E. H. New, and H. A. Payne; whilst besides paintings by many of the above are others of merit by Messrs. Treglown, Tarding, and Muckley, and some architectural drawings by Mr. A. S. Dixon. Altogether, the exhibition is of considerable interest and well arranged.

ALTHOUGH we do not profess to deal with musical subjects in these columns, except in connexion with architecture, the Handel Festival is a kind of exceptional event on which a word may be allowed, especially as the Crystal Palace Company are kind enough to recognise our general interest in art by the offer of seats on the occasion. Although the claim sometimes made that Handel may be regarded as practically an English composer will hardly bear examination, he belongs to us in so far as he made this country his permanent abode and the scene of his principal labours, and the great festivals held triennially at the Crystal Palace are much more worth calling "our Olympic games" than the Derby, to which that definition has sometimes been applied. The spectacle itself of the immense crowd of performers and auditors is one worth seeing, in spite of the drawback of the building, inadequate both in an architectural and musical sense. It is owing to the acoustic permeability of the glass palace that the effect of the great body of voices and instruments is not fully realised; and it would be worth while, artistically, to erect a solid walled building with an orchestra and auditorium on the same scale, for such performances, though it may be doubted whether such a scheme could be financially remunerative. As it is, with a certain degree of failure in comparison with the means employed, we every now and then obtain at a Handel Festival effects of climax such as are never forgotten, and are in themselves worth going to hear. In regard to this year's Festival, the performance of the "Messiah," which as usual occupied the first day, was more than usually good; such a piece of chorus-singing, on so large a scale, as the delivery of "All we like sheep," was something to remember. Mr. Santley, last survivor of the great school of Handel-singers, gave a performance of "Why do the nations" which, as a piece of brilliant vocal execution made distinctly audible in so vast a space, was quite phenomenal. The organ was wanted in some passages where it was omitted; e.g., at the point "For the mouth of the Lord hath spoken it," in the first chorus. The Selection Day was not quite as interesting a programme as usual in regard to the choruses, which moreover were too few and the solos too many, considering that solo-singing in so large a space is always a struggle with difficulties. There were some fine efforts of solo singing, however; and some (which we will not specify) which served to remind us sadly of the days when

there was a Sims Reeves singing at Handel festivals, and when some great tenor airs were given in a very different fashion. Madame Melba gave a remarkable performance of the show air with the flute accompaniment (the "nightingale" air), from "L'Allegro," but was not equal to "Let the bright Seraphim"—again reminding us sadly of great singers departed, whose places are not filled. One of the pleasantest recollections of the day was the firm execution by Miss Ella Russell of the slow unaccompanied sentences which alternate with the chorus in the opening of "As from the Power of Sacred Lays"; for a singer with the defect of rather limited physical power to contend against, it was a remarkable effort, and better worth recognition than some of the more showy performances of the selection day. The attendance was large and the weather beautiful. Mr. Melville, the impressionist artist of the Society of Water Colours, might find a field for his talents in depicting the effect of the chorus as seen from the auditorium.

#### ROYAL INSTITUTE OF BRITISH ARCHITECTS.

THE concluding meeting of the session of this Institute was held on Monday evening last at 9, Conduit-street, Mr. F. C. Penrose, M.A., F.R.S., F.R.A.S. (President), in the chair.

Mr. W. H. White (Secretary) announced the decease of Mr. W. Calder Marshall, R.A., for many years an honorary associate of the Institute.

*Assassination of M. Carnot.*

The President moved:—"That the Royal Institute of British Architects desires to be associated with the Central Society of French Architects in the expression of horror and indignation with which the news of President Carnot's mournful death has been received; and to offer, on behalf of British architects at home and beyond the seas, respectful and sympathetic condolence with their colleagues of France in the terrible calamity."

Mr. Charles Barry seconded the motion, which was unanimously agreed to.

*The Royal Gold Medalist.*

The President then said:—"This evening we have before us a grateful task, and one in which I feel it to be a high privilege to take a share, in presenting, in the name of our gracious patron, Her Majesty the Queen, the gold medal to one who has greatly honoured us by accepting it on our recommendation. The distinguished President of the Royal Academy is well known to all of us here by his works and by his renown, and to many by his friendship, and his genial courtesy to all who have had any intercourse with him."

As it is possible that someone who has not sufficiently followed the considerations which have guided the Institute in this award might ask, Why should a medal intended for the recognition of architectural merit be awarded to a painter? I propose addressing myself briefly to that point by-and-by; but, in the first place, I will endeavour to trace shortly some of the steps by which our distinguished friend has attained the highest eminence in our British world of art.

Sir Frederic Leighton was born at Scarborough, and his natural inclination towards the graphic arts early declared itself. His father, a physician, though he had other views for his son—intending, it is said, to give him a University education, with a view to his ultimately being called to the Bar—nevertheless encouraged him to make himself acquainted with anatomy, and gave him every facility for the study of art in order that he might be equipped for the profession should he eventually assent to his following it. We early find him, then, studying at Rome; and, if I may be allowed a moment's digression, this leads me to reflect that I must have occasionally fallen in with him during the winter and spring months at the Artists' excursion called the Cervera, or on the Pincio, or when it was the ambition of the British art students who were there to fall in with John Gibson at his early coffee at the Lepre. Dr. Leighton became so far a convert to his son's wishes as to consent that his drawings should be submitted to the celebrated American, Hiram Powers—a man not less remarkable for his great skill as a sculptor and his knowledge of art than for his noble physique, his courteous manners, and his sterling character—and if he decided that there was the true artist's

ring about these works, his son should no longer be opposed in following the bent of his inclination. We may, I think, appreciate the pleasure which the good American had in assuring the father that there could be no doubt whatever on the subject. After this, the youthful painter studied in various European centres, and made himself proficient, not only in the art of the countries in which he sojourned, but also in the languages, as those who have heard him discoursing with foreigners can testify. At Brussels, when eighteen years of age, he produced his first finished picture, "Cimabue finding Giotto in the Fields." He shortly afterwards showed his sympathy with our profession by a painting of which the subject was the death of Brunellesco. After some residence in Paris, working at the Louvre, he studied at Frankfurt under the painter Steinle, to whom he submitted the design of his magnificent picture "The Triumph of Cimabue," which he carried out at Rome. I have heard that during this period Thackeray fell in with him and prophesied that, although as yet altogether unknown in England, he would become President of the Royal Academy.

The great picture above referred to was sent to England for the Exhibition of 1855, then held in the rooms of the present National Gallery. The seniors here present can remember, and many of the juniors who saw the picture when it was exhibited again at Manchester can well understand the fervour which was created on all sides by the unexpected appearance of such a work by a man hitherto unknown. The picture was immediately bought by the Queen. But, for the present renouncing what might have seemed a lucrative opportunity for accepting work in London, he returned to his studies, and resided for some years on the Continent, chiefly in Paris, in communication with some of the most distinguished painters of that capital. Soon after his return to England, he painted the fine fresco representing "The Five Foolish Virgins," in the church at Lyndhurst, in the New Forest; and in the same material, but more recently, two large fresco paintings at the South Kensington Museum, representing the Industrial Arts applied to Peace and War. It is, however, impossible, in the space here available, to enumerate anything like a list even of his principal paintings. "The Power of Music" was exhibited in 1856. The great classical subject of "Hercules Wrestling with Death for the Body of Alceste" must be specially mentioned. This called forth the praise of his friend Browning in the poem called "Balaustion's Adventure":—"I know, too, a great Kaunian painter, strong As Herakles, though rosy with a robe Of grace that softens down the sinewy strength, And he has made a picture of it all."

More lately we have seen the fine, pathetic picture of Andromache, *dejectam conjuge tanto*, in her captivity. In 1881 the merited compliment was paid him in the request from Italy that he should contribute his portrait to the gallery of distinguished painters in the Uffizi at Florence.

Thus far we have followed his career as a painter; but, not content with the triumphs of his brush, he has invaded the sculptor's domain. In 1877 we admired the fine group of the "Athlete Struggling with a Python," and in 1886 his bronze statue of "The Sluggard." I shall presently have to speak of his potential claim to graduate in architecture.

I necessarily omit much. Of him it can without exaggeration be said, *Nihil teltig quod non ornabit*. Up to 1883 he had for many years, as their Colonel, led the Artists' Corps of Volunteers. His eloquence in presiding at the Royal Academy dinners is the theme of all. The social side of his character is equally admirable, and many are those who can bear witness to generous actions on his part, both in purse and kind sympathy.

I do not suppose there is anyone in this room who questions that the Institute has been thoroughly right in making the award of this medal which we have the happiness of bringing to its consummation to-night; but, as I said before, in case there should somewhere be a doubter, I will make a few remarks on that head. Had Sir Frederic Leighton no other claims upon us than the noble architectonic works that have often been products of his hand, works, many of them in oil and fresco, executed for the embellish-

\* The dates of the principal steps of Sir Frederic Leighton's advancement are these:—Associate of the Royal Academy, 1864; Royal Academician, 1869; President, 1874. In the last-named year he was knighted, and in 1886 created a baronet. In France he is an Associé Etranger of the Institut (Académie des Beaux-Arts) and a Commander of the Légion d'Honneur. In Germany the rare distinction of Frederick the Great's "Ordre pour le Mérite" has been conferred on him—an honour accorded to very few.



ment of public and private buildings, the Institute would have a perfectly good answer to give. The late Prince Consort thus defined the ruling principle—namely, that the appropriation of the Gold Medal should be left an open question to be raised according to circumstances in each year, and to be applied as the Council might periodically feel to be the best for the general interests of the profession. The Institute would therefore be justified in awarding the medal to an artist of high distinction either as a painter or sculptor. But Sir Frederic Leighton is very much more than a painter. He is the only President of the Royal Academy, from the time of its first foundation, of whom it can with certainty be said that he has evinced a thorough knowledge of all the great Arts, and who is practically great as a painter, a sculptor, an orator, and a writer.

The greatest master in Art since the days of Pericles is reported to have said, "I know but of one Art." There have been but few who could justly adopt those words, but one of those few is Sir Frederic Leighton. Similar to its tripartite analogy in Nature, where length, breadth, and thickness form one space, so architecture, sculpture, and painting are one in Art; the practice is different, but the principles, whenever excellence is touched, are found to be the same in each branch. You know Sir Frederic Leighton's high achievement in sculpture. In architecture there is the clearest evidence of what I have called his potential merit had he had occasion to practise in our special branch.

In biennial Addresses to the Students of the Royal Academy, particularly in the years 1880, 1891, and 1893, we find criticism of the highest value clothed in beautiful language on the Spanish, French, and German Schools of Mediæval Architecture. Not mere sketches and generalisations, but dealing with the subject in an exhaustive manner. Our ex-President has most happily and justly eulogised these addresses, saying in his discourse to students at the beginning of this year, that they demonstrate in regard to architecture that their writer "possesses an intelligent and a critical grasp of the subject second to no modern author. To few indeed is it given to combine with wide historical research and keen critical acumen the indescribable charm of composing poetry in prose. Let me commend to your thoughtful attention the study of these singularly learned and graceful discourses."

That an artist of such refinement would also be in sympathy with the spirit of Classical architecture will not be doubted. I had myself frequent opportunities of bearing witness to his appreciation of the elements of beauty in the works of the Greeks at meetings of the Publication Committee of the Society of Dilettanti; but I wish particularly to call your attention to the masterly summaries of the characteristics of Mediæval architecture as practised by the leading races of Continental Europe in the Academy lectures before referred to. The whole series is full of practical teaching in clear and incisive language; but, as in this address limitation is necessary, I will confine myself almost entirely to what is said on the evolution of Gothic architecture from its source at Saint-Denis. After a short discussion of the earlier manner of vaulting from the Roman type, in which stability for the wagon vault was sought in the resistance of solid masses of brick and concrete work, we read,—

"The substitution of the principle of a balance of active forces to this principle of inert resistance is probably the greatest revolution ever introduced in the science of building; we have here the generative principle of Gothic architecture, its essence, and its life. How this revolution was brought about I can, of course, only indicate to you in summary outline. Let us first note in passing that the presence of a pointed arch, except as a structural form, does not constitute Gothic architecture. Isolated radiating pointed arches have been built in ages and countries in which the Gothic style was not dreamt of; a building might be Gothic in structure and principle without showing a pointed opening anywhere; it is through the roof, not through the window, that the formative Gothic idea entered."

Then, after describing various expedients for securing stability, including the important step taken at Vézelay, where intersecting vaults, but without ribs, were substituted for the continuous wagon-head—an advance, but not yet satisfactory—we read: "A few years later, in the early middle of the twelfth century, a Benedictine monk, feeble of frame, but of a lofty spirit, Suger the great Abbot of Saint-Denis—who has on sculptors, by the bye, this special claim, that he

boldly withstood the bitter denunciations launched by St. Bernard against the sculptural decoration of churches—began the erection of a church in which the tentative gropings, at which I have just hinted, gave place to the systematic and logical application of a new and fruitful conception—the idea of stability based on the balance of active forces, expressed in a self-sustaining combination of upright supports and vaulting ribs, with detached buttresses bringing their action to bear exactly on the points at which the thrust of the vaults is gathered up."

The address concludes: "Is there any lesson that we may draw from this hurried survey of artistic evolution among the French? I have dwelt with emphasis on the genius of their Mediæval builders; do I advocate—the young architects for whom I have mainly spoken to-night may ask—do I advocate the adoption of Gothic forms for the purposes of our own lives? I have spoken to little effect if my answer can be doubtful. Artistic forms are the vesture of ideas and the expression of mental conditions; the ideas and mental conditions of our day are widely removed from those of the Middle Ages; the modern mind cannot with fitness put on the garb which was moulded on the mind of a day long past. But if we may not fitly adopt those forms, we cannot too reverently note the spirit which presided over their development, for a like spirit brought to bear on other material and under other conditions may yet bear new and noble fruit. And the characteristics of that spirit are—a masculine independence, a tenacious grasp of central principles, a fearless sincerity in expression, a scorn of shams, and trust on truth."

In Sir Frederic's address for last year we find admirable criticisms on the German Mediæval architecture; praise where due is given to the German Romanesque, and afterwards the reflection, which appears to me perfectly just, that the Germans as a race were never in unison with Ogival architecture; and in respect to their great achievement—Cologne Cathedral—though not withholding praise, he observes as I think most truly:—"We feel that we are in the presence and under the spell of a powerful will, grasping serenely and solving with unflinching and intellectual resource a scientific problem; we bow accordingly before a triumph of skill and volition; we are not, as it seems to me, thrilled by the kindling touch of genius."

To the pictorial works by Sir Frederic Leighton in connexion with architecture already named may be added paintings for the ceilings of a house at New York, of which our Gold Medalist, Mr. R. M. Hunt, was architect, as well as several of the same character in London. But I must specially mention one work combining architecture in the solid with which he has had much to do. I allude to the removal of Alfred Stevens's monument from the south chapel in St. Paul's to the nave for which it was originally designed, which was done entirely under his inspiration and in no small degree at his expense. I feel sure that there can be no need for me to dilate further on what seems to require no argument in justification of the action of our ex-President and of the Council, and of the Institute which has ratified their action in awarding this medal, especially when, to the great advantage of the Institute, Sir Frederic Leighton's acceptance of it sheds lustre on the roll of medallists; so well begun with the loved and honoured name of Professor Cockerell; and it must be obvious to all of us that the whole profession gains from the fact that the chief representative of Art in its three branches in this country thereby shows how much he is in sympathy with architecture.

The President then presented the medal to Sir Frederic Leighton.

Sir Frederic Leighton, Bart., P.R.A., in reply, expressed his deep and warm sense of the great honour he had just received, an honour which he understood to be awarded, for the first time in the annals of the Institute, to a painter. This honour was very much enhanced by the terms in which his old and honoured friend, their eminent President, had sought to testify before his hearers as to the abnormal nature of the award. He was touched by those words, and by the cordial reception they had met; but none the less he was very much embarrassed by a sense of the exiguity, on the most favourable estimate, of the services he had rendered to the ancient and noble craft to which the Institute ministered. It might perhaps be said that enthusiasm and sympathy were contagious, and that he rendered in his small degree a service to art, who contributed towards that atmosphere of fostering interest in which creative effort alone could fructify and prosper. Assuredly,

in reverent enthusiasm for an art, which had clothed in stone and marble so much of sublime inspiration, and which had invested use, with its moving cause, with beauty and eloquence, there was nobody in that room to whom he would yield advantage or precedence. And since a painter—and if he might without immodesty assume for the nonce the honourable title of a sculptor—had been made the recipient of their highest favour, they might perhaps bear with him, whilst in a few words he professed his faith in regard to the relation of the three arts, the one to the other, subject on which much divergent opinion had often been expressed, and in regard to which, it seemed to him, a certain confusion of thoughts sometimes obtained. Thus, he thought, none would deny that the co-operation of the arts had bestowed on this world some of its choicest masterpieces. None would deny that, whilst the house of the Virgin Goddess at Athens would have been a supreme work, with its balance of strength and subtlety, without the added majesty of the Phidian sculpture, nevertheless the collaboration of Phidias and Ictinus had added to the dignity of that perfect edifice. Nor, he thought, could it be denied that the purple radiance of the lights of Chartres Cathedral, or the sombre gleam of the mosaics at St. Mark's, had considerably heightened the poetry and appeal of those two famous structures. Neither, he thought, could it be gainsaid that great advantage must accrue to the professors and votaries of the arts by the command of a sympathetic insight of the nature of the other two and of a living perception of the affinities which united them. On the other hand, the fruitfulness, the solidarity—if he might be allowed to use an un-English expression—between them had, he thought, led to some misapprehension with regard to the character of the relationship. In sight of the magnificent results of the union between them; in sight of the fact that the graphic arts had so often furnished the highest adornment to the works of the architect, adorning them as the flower adorned the tree; in sight of the highest significance of architecture—a significance which he feared was not always sufficiently remembered, as expressing in its works a temper and spirit of nations and epochs; in sight of these things, it seemed to him that some had been led or misled into assuming that the only fit and proper function of the graphic arts was to enhance and adorn the work of architecture, and that, therefore, architecture was, in a manner, the generating and master-art to which the others were bound to be subservient. He was aware he was treading on delicate ground, but they must allow him to affirm that that assumption, together with its corollary, the subordination of the other arts, was a short-sighted fallacy, and showed but scant appreciation of the nature of that house of many mansions—the house of art. Even in the face of architecture, the art which had man for its subject, and the many-mooded aspects of the outer world, stood erect and unabashed. Even in the presence of the followers of Ictinus, of Robert de Luzarches, of Brunellesco, and of Christopher Wren, the followers of Phidias, Michelangelo, and Donatello, and the disciples of Raphael and Titian, Rembrandt and Reynolds were not prepared to strike or veil their colours. In remote Mediæval times, when the building was the book, the one open volume in which the unlettered people could read, as they ran, the principles of the faith; in the days before the printing press had robbed architecture of half of its phonetic function, such a claim might have seemed easily established. But in more modern days great changes had come over them, and notably over the art of painting, which, after abdicating for the moment its more severe and restrained function in connexion with architecture, and its more monumental and idealistic developments, had explored and made its own whole new regions of emotional and imaginative suggestions—the regions, for instance, of mysterious gloom in which Rembrandt was king, and the whole range of those fugitive and fitful lights which flit and flame and faint across the fair face of land and sea, and in which Turner conjured without fear. In those phases the art of painting was self-centred and unbehelmed. But whilst, at a time when a narrow isolation was repudiated by architecture, some of its followers nevertheless invited the other arts to what was but a gilded vassalage, they could see, on the other hand, a tendency perhaps less seldom than they should like—in an entirely opposite direction—a tendency to install picturesqueness in a perilous position of prominence—a tendency to forget that every portion of every art should be a part of the organic,



logical development of the whole, grafted on material conditions and requirements scientifically grasped. He referred to a tendency of art for the surface, and even in particular and extreme cases to mistake for the exercise of a virile and logical art, a mere sprinkling of ornament broadcast and haphazard over a perhaps incoherent and confused structure. It had happened to him to be asked more than once, and by gifted and earnest students, to express his views on the subject of architecture from the painter's point of view. Now, his answer had invariably been, and ever must be, that he acknowledged in architecture no painter's point of view. Architecture being an art of which the conditions were unique, as well as imperative, recognised no determining artistic motive outside itself, and its conditions were, he repeated, the rigorous fulfilment in each case of a dictated problem of utility, resulting in a structure representing and expressing its necessary functions, lit-up and ennobled by a spirit of beauty throughout. He said "throughout" because that spirit should leave it from its very birth, and the sense of it should grow and blossom with it, and not be thrown over it as a superfluous garment, or an adventitious gloss. It seemed to him that the beauty of a truly noble edifice should be as the inner soul, looking out of it, and made manifest, and not as a fair mask put on, or laid aside at will. These ends might be achieved by those to whom the gift was given for the cultivation of the inner aesthetic sense, so that it would flow out on to the work, and permeate it from its birth, and use and decorum would go hand in hand to work common enhancement. This sharpened sense of beauty—and he used the word in its widest sense—was in reality the stamp and hallmark of every artist, whether he built, or carved, or painted. And, inasmuch as the labours of the painter were less trammelled by considerations of the necessary and the useful—in fact were entirely untrammelled by them—it was evident that intercourse with the pursuers of the purely graphic arts must be a value and strength to those whose paths were less free, and their trammels more numerous. But if architecture might gain, from intercourse with the other arts, perhaps a heightened charm, how great was the service that she, in her turn, might render to the painter and the sculptor if properly consulted; for where better than in her purest works would every painter and sculptor learn the greatly-needed lesson of wise reticence, of noble restraint, of strength husbanded and controlled, and of ornament made precious by its sober use? Of a truth the three arts might gain indefinite enhancement by a closer spiritual union between the votaries of each of them. It was as a symbol of this closer union that even those who might least deem him fit would welcome that honour, for which he begged again to offer his warm, sincere, and respectful thanks.

The President then announced that the opening meeting of the next session would be held on November 5 next, and the proceedings terminated.

#### INCORPORATED ASSOCIATION OF MUNICIPAL AND COUNTY ENGINEERS.

The twenty-first annual meeting of the Incorporated Association of Municipal and County Engineers was held in the lecture-room of the Institution of Civil Engineers, Great George-street, Westminster, on June 21. Mr. J. T. Eayrs, C.E., of West Bromwich, presided at the opening of the meeting, and was supported by Mr. A. M. Fowler, C.E., of Manchester, the President elect, and a large attendance of members.

Mr. T. Cole (Secretary) read the annual report of the Council, which stated that 71 new members had joined the Association during the year—58 ordinary members and 13 graduates. The number on the roll at the close of the year was 9 honorary members, 537 ordinary members, and 53 graduates—a total of 599. The Council congratulated the members on the continued success of the Association, and reported that Mr. A. M. Fowler, of Manchester, had been elected President, and Messrs. Binnie, London, Escott, Halifax, and Lowe, Hampstead, Vice-Presidents for the ensuing year. The premiums for the best papers read during the year had been awarded, the first of 10*l.* to Mr. G. Hodson, of Loughborough, on "The Consideration of Some Conditions Affecting Underground Water Supply," and the second of 5*l.* to Mr. J. S. Pickering, of Nuneaton, on "Severe Difficulties at Nuneaton, and How They Have Been Solved."

The President proposed the adoption of the

report, which was seconded by Mr. McCallum, and carried.

The President then presented the awards of premiums for the best papers to Mr. Hodson and Mr. Pickering.

Mr. Lewis Angell (West Ham) called attention to the recent decision of the Courts by which combined back drainage was declared to be public sewers. This would impose a very heavy responsibility upon the Local Authority, and he suggested that action should be taken to obtain an alteration of the law.

Mr. Savage, whose district adjoins that of Mr. Angell, said he had always recognised his Board's responsibility in this matter, which he thought was much the better plan.

Mr. Angell admitted that Mr. Savage's view was the right one in a new district, but his own district was an old one, and were they to take up the legacy of the wrongdoing of the last fifty or hundred year?

Mr. Wike (Sheffield) proposed that the question of combined drainage is becoming of such great importance to all local authorities that the question be referred to the Council of the Association for their immediate consideration. He remarked that Sheffield, which was not a new town, was afflicted with a number of districts called crofts, which were drained into back-yards, and it would mean a cost of thousands of pounds a year to that town.

Mr. White (Oxford) seconded the proposition, which was supported by Mr. Mawbey (Leicester) and adopted.

The retiring President then installed into office his successor in the chair, Mr. A. M. Fowler, C.E., of Manchester. He said he felt sure that Mr. Fowler would uphold the dignity and look after the interests of the Association as well as any other member who had been elected to the chair. Mr. Fowler was one of the original members of the Association; he had attained the very highest eminence in municipal engineering, having been engineer for the Boroughs of Leeds, Salford, and Newcastle-on-Tyne, besides occupying the position of Surveyor at Stockport.

The new President then took the chair amidst applause.

Mr. Lewis Angell then proposed a vote of thanks to the retiring President, Mr. J. T. Eayrs. The dignity and prestige of the Association, he said, had not suffered during Mr. Eayrs' year of office. He had shown at all times the greatest possible interest in the work of the Association, and during his year of office had attended every council and district meeting of the Association. Those who went to West Bromwich knew the great respect in which Mr. Eayrs was held in his own district.

Mr. Ashmead (Bristol), as one of the oldest members, seconded the proposition, which was supported by Mr. Mawbey, of Leicester, and adopted unanimously.

Mr. Eayrs, in acknowledging the vote of thanks, said that though he had passed the chair, his interest in the Association would not lessen in any degree. He assured young members that they would gain through the Association professional knowledge which they could not gain by any other means whatever.

The President (Mr. A. M. Fowler) then delivered his Presidential address, from which we make the following extracts:—

After some introductory remarks, the President said: This meeting, as you are aware, records the twenty-first anniversary of the Association, our first meeting having been held in this—the parent Institution—on May 2, 1873. At that time there were but 163 members, and we now number upwards of 600 members, which is very gratifying to realise. In the early days of the Association, as some of you are aware, there was some difficulty in obtaining papers, and more so in inducing members to discuss the subject-matter brought forward. It may, therefore, be fairly said that the Association has not been idle during the period of its youth, having visited upwards of 130 towns and local board districts, which include all the large municipalities in England, and some in Ireland, embracing the inspection of public works, mills, and manufacturing in the various localities. Three hundred papers have been read and discussed on every subject appertaining to municipal and sanitary engineering. These must have supplied most valuable engineering information. They have also informed us of the manufactures of the country, some of which are closely allied to the work of the profession. One cannot help being struck with wonder and amazement, not only with the improvement in locomotion by land and by sea, but by the improvements which have been made

in the science of sanitation, and the improvements in the construction of dwellings generally, and in the large thoroughfares of our large towns during this generation. For I well remember on two occasions travelling from Leeds to London, by the four-horse coach, before the railway system was fully developed. At that time (1843) the journey of 186 miles was completed in twenty-six hours, when it was considered that the main highways of this country were in a state of perfection—while the journey is now performed by means of the locomotive and the aid of the civil engineer in four hours. At that time also municipal work—especially with regard to sanitary engineering—may be said to have been in its infancy (although it was being raised by works of Dr. Southwood Smith), for in a few years later (1849) a great plague of cholera broke out in Leeds—my native town—and the inhabitants of some of the streets, viz.: Cavalier-street in particular, were exterminated. It was not until then that the municipal authorities were brought face to face, not with the law of Westminster, but with the law of Nature, the penalty of which was felt heavily throughout the length and breadth of the land, by the absence of the necessary provisions for the quick removal of filth and contagion from our midst. I now come to some of the great works which the municipal institutions of the country have recently undertaken. It would be impossible, in a short address, to even give a faint idea of what has been done in the past few years, and the enormous work now in active progress of development. The large amount of capital borrowed by some of our large towns, for the construction of public works, will give some idea of the power, the grasp, and the evident sense of responsibility which public authorities have for the advancement of sanitation, and improvements of the centres of population; viz., Leeds has now a debt of 4,205,926*l.*; Salford, 1,716,397*l.*; Manchester, 11,716,285*l.*; Birmingham, 7,747,095*l.*; Liverpool, 7,497,214*l.*

The great benefits which have recently accrued from the time and thought given by business men in town councils to municipal matters, has resulted in corporations re-arranging their stock, and borrowing capital for lengthy periods, in some cases for as long as sixty years, at the rate of in many cases under 3 per cent., and also by making the stock negotiable. These debts have not been entirely incurred directly for sanitary works proper, although the money is being expended with a view to the improvement of the public health, as in the case of acquiring water-works, gas-works, tramways, hydraulic power, electric lighting, &c. All such undertakings, which formerly were in the hands of private companies, may now be said to be transferred to municipal authorities, and show in the capital account substantial assets, whilst the benefits derived by the ratepayers are considerable, not only on the ground of convenience and public health, but because they are also more economical.

In fact, the profits on gas, water, and tramways in some towns go far to pay the cost of public improvements. As in the case of Salford during the time I acted as Engineer, the town, by laying down the tramways in pursuance of its own Parliamentary powers, obtained a rental of 10½ per cent., whilst Newcastle in like manner obtained 6½ per cent. on the cost of construction; the only obligation being to keep the road in repair, whilst the new paving, sometimes of granite, was included in the capital account on which the interest was charged, thus bringing in many thousands of pounds per annum. Many towns have availed themselves of the power offered by Parliament for providing electric lighting, and this is fast coming into universal adoption for private houses; the only drawback at present being the expense in providing the necessary motive-power to bring it in closer competition with the cost of gas-light. This is, however, being daily reduced for small concerns by the introduction of "Dowson's" gas-engines and plant with the application of anthracite coal, which is less costly than ordinary coal gas. This plant has now been running engines for some time with an expenditure of not more than 1½*l.* of fuel per indicated horse-power. Oil-engines are now also worked at a fraction less than one halfpenny per hour per horse-power. It is with hope, therefore, that the motive power for working dynamos may, at no distant date, be reduced in cost. Other great and general improvements have been made in the regulation of railways passing through large towns, by the reduction of sound, and the prevention of obstruction to light and air, by their construction. For although the locomotive and the railways



have been a boon and a blessing to men, it behoves the municipal engineer to carefully seek to protect the inhabitants of large towns by preserving the light and air from being obstructed by high embankments and viaducts. Manchester, Salford, Stockport, and Leeds have been fully alive to this. And in some cases where railways have been the means of clearing away the worst class of rookeries and of filth, these corporations have stepped in and availed themselves of the opportunities of making new streets, and securing air space, in conjunction with the railway company. This is especially so in regard to the railway works now in course of construction through the heart of Leeds, where Mr. Thomas Hewson, M.Inst.C.E., and member of this Association—the City Engineer—has succeeded in making vast improvements to that town in this respect, which would not otherwise have been done but for his foresight and energy, and therefore would have retarded, for many years to come, the sanitary work of that corporation. Now that railway construction through towns is becoming better understood by the Municipal Engineer, embankments and obstructions, which have been formed in the past, might have been avoided by placing railways, perhaps in cutting, and the arches of viaducts, open, instead of as at present, closed, and forming solid blocks of obstruction. The noise has also been considerably reduced. The improvements in this respect may be continued to be realised without detriment to the noble and gigantic railway undertakings. The noise of vehicular traffic in the public streets, which so seriously affects the transaction of business in the busy thoroughfares of our large cities, has, by the introduction of the new wooden paving, been reduced to a minimum. The friction on street surfaces has also been reduced. For this, great credit is due to our late honorary member, Colonel Heywood, City Engineer, London, who has for many years past, by his investigations and valuable research, explained from time to time, in his reports, since 1866, the pros and cons of the different systems experimented upon since that date. The diminution in the sound of vehicular traffic, and the reduction of friction, has reduced the cost in wear and tear of horse-flesh and vehicles. And there is no doubt whatever that this reduction in the cost of traction has enabled the traffic to be worked at less cost; and so has reduced the omnibus fares in London, which could not have been obtained except for these improvements, which have also materially added to the health and comfort of the inhabitants at large. During the past twenty-one years some of our large cities have been almost rebuilt, as in Manchester, Leeds, Birmingham, and Salford: some of the streets in these towns have been widened from two to three times their former breadth. It may not be generally known that some of these improvements have been carried out free of additional cost to the ratepayers, as in Leeds, Boar Lane, and many other streets were widened and rebuilt, in pursuance of special powers granted by Parliament, from 19 ft. to 60 ft., by purchasing property, as in Boar-lane alone, to the sum of upwards of 165,000*l.* Previous to this action of the Corporation, a large area of land abutting on the street remained vacant for many years, at the price of 3*l.* per square yard, whilst after the new scheme was propounded, the first sale of vacant land by public auction brought 60*l.* per square yard, and other plots realised similar high prices. These results were obtained by the Corporation from its foresight in obtaining powers to acquire sufficient land beyond that actually required for the widening of streets, which additional width was designed to be about 50 ft. in depth, from the proposed new frontage, so as to form good shop premises, with the result that the land was greatly improved in value, and handsome buildings were erected, which improved the rateable value to such an extent that the town was not called upon for an increase in the rates. I mention this as a municipal matter, it not being generally known that streets in large towns may be widened and improved at little or no cost, saying nothing of the improved means of communication, comfort and ventilation. The City of London, in obtaining its "Betterment Clauses" for an approach to the Tower Bridge, has set an example which is being followed by Manchester in its Bill, now before Parliament. This is another way of meeting the demands for widening streets and the ventilation of large towns; but it is questionable as to whether or not the Leeds principles can be improved upon. Leeds also in acquiring land for Roundbay Park, ninety acres in extent, obtained

power to purchase more land than was actually to be appropriated. From those examples it is self-evident that land whatever may have been its previous value—is enhanced when it is known that a space in front is to be left open for ever. London is highly favoured in this respect with ten parks, covering an area of upwards of 2,000 acres, and with its eleven large commons in the out-far distant, will be closely surrounded by buildings. Having held office in the past as Municipal Engineer, I may say, in some of the largest towns in England, and for many years in business in Manchester, I naturally feel it incumbent upon me to say something of the gigantic works now going on, and about matured, in that city. Perhaps one of the greatest economies in Municipal enterprise is the plant just laid down by the Manchester Corporation, for providing hydraulic power throughout the city, whereby large blocks of buildings can be more economically laid out in flats, and the highest floors reached, with much less exertion than in an ordinary two-storied house. This, we know, has long since been introduced, and used, by Lord Armstrong, and applied for the lifting of heavy goods, as in London and Newcastle up to 1887. Liverpool, Birmingham, Melbourne, Sydney, Antwerp, Glasgow, and Hull also are making this provision. But Manchester, on February 1 last, completed its apparatus to bring this immense boon within the reach of all individuals, having laid mains through the city to conveyance for hotels and residential purposes of, say, 50 ft., with an extraordinary load of one ton, would not amount to more than 3*d.* per ton each journey. Briefly, there are four engines of 200 horse-power, each capable of lifting 240 gallons per minute, against an accumulated pressure of 1,120 lbs., with steam pressure of 120 lbs. The authorities have already made forty connexions. The economy, comfort, and convenience likely to accrue to professional men, and especially the working classes, to say nothing (for the moment) of the economy and convenience arising throughout to trade and manufacture, is almost incalculable. This great city (Manchester) of enterprise has also laid many miles of electric wires throughout the thickly-populated parts, also within the reach of all, and connexions are daily being made. The supplementary work of obtaining a water supply from Lake Thirlmere to that of Longdendale will also during the present year (in Manchester) be completed, when the two sources will yield forty-five million gallons per day. The Longdendale works were completed in 1877, and had cost, up to that time, 3,148,000*l.*, providing for about one million people. The population had by this time so enormously increased, that a further supply was sought, and Lake Thirlmere was decided upon, and the late J. F. Bateman, M.Inst.C.E., and the present Engineer, Mr. Hill, designed, and the latter has carried out the work. These are the largest gravitation works in the world. To give some idea of this extended scheme, the reservoir at Thirlmere lake, when enlarged, will cover an area of 793 acres, with a capacity of 8,130,686,693 gallons. The watershed extends over 11,000 acres. The water will be conveyed to Manchester by upwards of 95 miles of conduiting. The quality is of the highest possible standard, and contains only 7 deg. of hardness. This, as compared with London, is upwards of 15 deg. softer. I estimate the saving in soap and labour, comparatively (on the data of the Royal Commissioners' Report, 1868), to amount to upwards of 300,000*l.* per year. If London had such a water the saving in soap and labour would be upwards of two-and-a-quarter millions sterling per year. This Manchester scheme will yield fifty million gallons per day. The scheme provides for conveying the water as required by means of pipes, each capable of delivering ten million gallons per day. The first instalment will be completed this year. The cost of this great undertaking will amount to about 2,500,000*l.* This is for the first instalment of ten million gallons. When all is utilised to the full extent, and the lake raised 50 ft., the total cost will be between 4,000,000*l.* and 5,000,000*l.* for five million gallons. This year (1894) has also seen the completion of the scheme for intercepting and treatment of the whole of the sewage at present flowing into the rivers Irwell, Irk, and the late Mr. Allison, M.I.C.E., and member of this Association, who very recently read a description of the works and personally accompanied the members of this Association over the same when

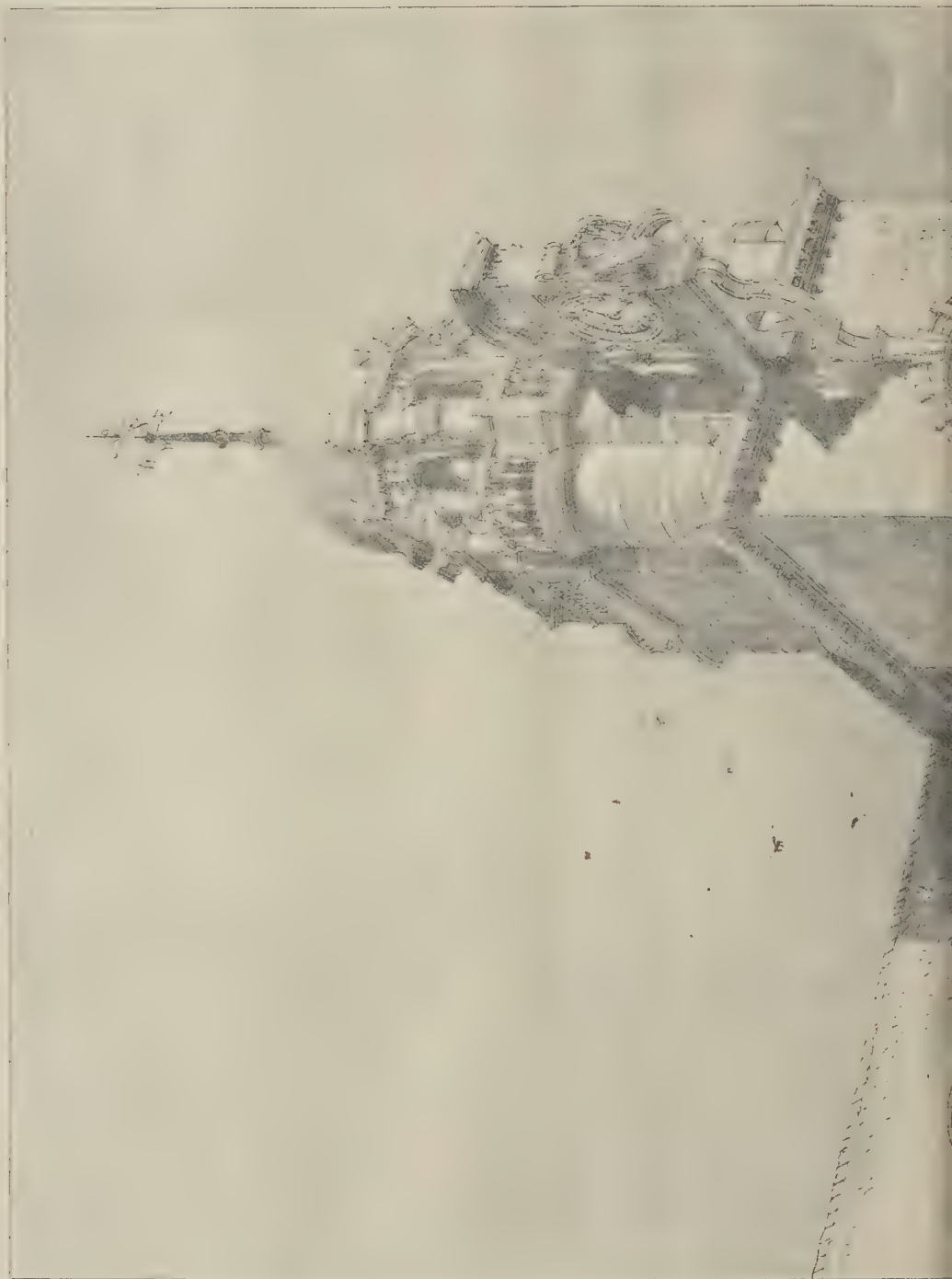
in progress. He died in harness in the heyday of his professional life, a loyal and respected officer. This eventful year for Manchester has had the crowning success added to its achievements of having a highway opened out to the sea by completion of the Ship Canal inaugurated by Her Most Gracious Majesty the Queen on May 21 last. This, as you are aware, has become of late years a municipal work. The Corporation of Manchester now represents more than one-half the board of directors. It has provided the large sum of five millions to enable the company's capital of eight millions to enable the undertaking to be completed. This appears to be an enormous sum for a municipal authority to advance, and is unprecedented; but when we reflect upon the many great schemes and undertakings this city of Manchester has entered into, they may all be said to be unprecedented. Although the Canal itself at present is not in that flourishing condition expected of it from the prospectus, &c., issued on its promotion, yet as a municipal undertaking it has, no doubt, already paid the inhabitants of Manchester inasmuch as the railway freights between Liverpool and Manchester since its commencement, and the shipping at present carried on (although limited) is a great boon to the city. Having mentioned some of the municipal works of magnitude, I would now refer to the most urgent sanitary questions of the day with which I am at present engaged. The work of the municipal engineer may be said to consist of the construction of sewers, tramways, bridges, roads, and streets, waterworks, and sanitary engineering generally; but in a short address it is not possible to make a *resumé* of all the undertakings with which one in the past, or even at present, is closely allied. The most important topic of county councils, boroughs, and sanitary authorities, is the construction of main intercepting sewers in their respective districts, so as to treat and deodorise the sewage before being turned into living streams. These remarks apply particularly to the Manchester Ship Canal, which stream has become in a worse sanitary condition since its construction; for while the river Irwell (which is now absorbed in the Canal) through Manchester, in its former state—was a nuisance by damming up its waters by weirs 6 ft. or 8 ft. deep, the Canal now forms pools 22 ft. deep, which bring the waters at rest, and assist the precipitation of the sewage matter from the water-sheds of upwards of a million acres, studded with towns and manufactories, with a population of 2½ millions, all discharging the drainage and effluents therefrom into the Canal. The stench can be perceptibly noticed half a mile away. To remedy this and the former state of things, the Salford Corporation have been experimenting for years on almost every eligible patent, under the superintendence of professional experts, and elaborate reports at great expense have been prepared of the results. Up to the present time, however, nothing definite is decided upon for adoption.

The Corporation of Leeds exercised the same principle of testing the patent schemes some years ago, but since have used nothing but lime as a precipitating agent. It would appear that the time for experiments has passed, for there are at least twenty systems which will precipitate flocculent matter in sewage and produce a comparatively clear effluent; but when we come to analyse the cost they become impracticable. The Corporation of Manchester, for their new works, have settled the question—at all events for some time—by adopting the medium of sulphate of alumina and lime as a precipitant and passed the effluent therefrom through land. In designing the large works of Leeds for the clarification of sewage, at that time, there was no data upon which to formulate a scheme. The Leeds Corporation expended 10,000*l.* in experimenting, and on structural works, before laying down the permanent plant to treat the sewage (about 10,000,000 gals. daily) before entering the river (about the time when the cattle plague first broke out in England, in Thorpe Hall pastures, on the banks of the river Aire, just below the sewer outfall at Leeds). Having to treat the sewage, the question of keeping as much of the rainfall out of the sewers was enforced upon me. Then commenced observations of heavy rain as affecting the capacity of main sewers to prevent augmenting the bulk of sewage, and water to be dealt with at the outfall, especially with respect to the extension of the sewers to the outlying districts of Leeds, within the borough, which borough, I may here mention, contains an area of thirty-four square miles, with a population of





THE BUILDER, JUNE 30, 1894





NORTHAMPTON INSTITUTE: ENTRANCE AND TOWER.—MR. E. W. MOUNTFORD, F.R.I.B.A., ARCHITECT





360,000 as compared with the population in 1866 of 230,000. I then came to the conclusion, from observations of the flow in the sewers, that during heavy rain the sewage was little worse than ordinary surface water. I was materially assisted at that time by reference to the researches of Mr. J. W. Leather, M.Inst.C.E., and Mr. J. F. Bateman, M.Inst.C.E., on rainfall generally, with the object, therefore, of reducing the flow in the sewers. I had careful records made for many years in Leeds and Salford on the down-pours of rain during short periods of time. The main sewers at Leeds were also gauged from time to time. At such periods I found that from 10 to 104 cubic feet per acre, per minute, was run off and discharged through the sewers, from localities well built up, and the streets paved and completed. This amounted to about  $\frac{1}{2}$  of an inch of rain run off from two thirds of the whole part, covered by streets and buildings, or about  $\frac{1}{3}$  of an inch per minute from the whole area. To treat such quantities of rain at the outfall was next to impossible. I therefore determined to pass off the flood waters from the sewers, when the same became diluted to about six or seven times the bulk of neat (dry weather flow) sewage. On this data I designed the main intercepting sewer for Salford, and am now carrying out the main sewer for Stockport and other towns. The sewers laid down by the late J. W. Leather, M.I.C.E., in 1857 were then far in advance of the times, securing as they did, a minimum velocity (in dry weather) of over 2 ft. per second. And the glazed oval socketed tubes for the main and some branch sewers were arranged, and the trapped iron gullies I have not seen improved upon to this day. These sewers, however, in consequence of recent enactments compelling authorities to deal with sewage, compelled me to pass off the flood water to the adjacent streams. Mr. Hewson, M.Inst.C.E., of this Association, the present engineer, has in the past, and is now constructing, I may say, gigantic works to pass off heavy rainfall from the sewers, and so diminish the quantity of sewage and rain to be dealt with at the outfall. By this means the sewers built some years ago, have not been enlarged, although the borough has increased in population enormously. I mention these facts, as I consider it is important to keep records of heavy rainfall during short periods of time in various localities, so as to design the sewers to meet the difficulty of passing off the same. For it is not the day's rain, but the rain that falls in an hour or so that makes it so difficult for the engineer to treat the sewage at outfalls effectively. Flood water becomes destructive, and stores in cellars, if uncontrolled, and places the sewer under pressure and damages it. The separate system so ably advocated some years ago by the late E. Chadwick, C.B., would meet this end, but I fear the absence of Nature's cleanser and purifier by rain would be dangerous to health, whilst the expense of constructing would be about doubled. Having realised the importance of keeping the sewers to a minimum size, I have designed the main intercepting sewers for Leeds, Salford, and Stockport so as to pass off flood waters by means of weirs fixed in the branch sewers, e.g., with a slip or opening formed therein, through which opening the neat sewage drops into the main sewer beneath, and admits of the heavy rain or flood water being passed off in the shape of a cascade over the slip, and so carried on into the nearest watercourse. These have been found to act most satisfactorily. They were conveniently introduced by reason of the mains being at a much lower level than the sewage to be intercepted. The Stockport intercepting sewer now in course of construction is equal to 7 ft. internal diameter, the works estimated to cost about 100,000, exclusive of land. The sewage to be dealt with will be about 10,000,000 gallons per day. The matter of annual cost of pumping was urgently sought to be reduced to a minimum. To meet this end the gradients have been flattened as much as possible, but so as not to reduce the flow to less than 3 ft. per second during time of drought. The sewer will pass beneath the river in five places, two of which will be by means of inverted siphons. To secure this velocity, and a minimum lift in pumping, the sewer is flattened in cross-section, at three of the crossings by means of irregular-shaped iron tubes, but securing an inclined plane on the invert, maintaining the same capacity. To augment the velocity in so large a sewer as 7 ft. during extreme drought, the invert is narrowed in the middle, to about 3 ft. in width, so as to contract the flow into a small channel in the shape of the narrow end of an egg, in cross section, at the same time leaving a footway on each side of the invert for

easier inspection. The Stockport sewage is to be pumped to a height of 16 ft. into tanks to contain about 158,000 cubic ft., to be there previously treated with lime and sulphate of alumina. The effluent therefrom will be passed over and through land about 6 ft. deep. I have merely touched upon some of the undertakings accomplished and in hand for the improvement of the health and comfort of the public, but there is much more to be done, especially for the poor in this respect, viz. I would call attention to the following wants:—1. Want of free public open-air-baths. 2. Heating of blocks of cottage property by hot water from a central station. 3. The providing of hot water in all cottage houses by this means. 4. Public shelters in different localities for the poor and desolate. These and many other improvements will cost but little as compared with other expensive undertakings, whilst to use a selfish term, they will to a great extent protect the rich in guarding against disease and distress. These benefits and saving in rates cannot be shown on the books of the Corporation, but it will materially assist in the keeping down of filth from floating in the atmosphere and spreading the germs of contagion, like the floating of the pollen of the thistle, which has been known to travel hundreds of miles, and plant its rankness amongst the best of cultivated ground. The large sums of money which have been expended by the Municipalities throughout the country in the vast improvements in sanitation, especially in the sewers, I have mentioned, have been the means of reducing the death-rate to a notable extent. Taking Leeds, for example, during twenty years, from 1870 to 1880 the death-rate averaged 29.4 per thousand; from 1880 to 1890 it was 22.7 per thousand—a decrease of 3.35 per thousand. Taking the average population at, say, 309,000, and the value of a life as estimated by that eminent man on public health, Dr. Farr, at 159l. per average head, the saving in Leeds alone has been 164,588l., at the rate of 8,229l. per annum, to say nothing of the reduction in distress and misery. No profession has contributed to the saving of life and preservation of health more than the municipal engineer. This is apparent from the healthy state of the country at the present time, as compared with some thirty years ago. Notably, London may be said to be now, and for some years past, the healthiest city in the world. The improvement in this respect dating from the time when the contents of 30,000 cess-pools was turned into the sewers by the enforcement of the Act of 1847. Not that legislation has done all to attain the improved state of health in this country, for we are indebted in this behalf, not only from the work of this Association, but from the exertion of the "Medical Officer of Health" and the Sanitary Institute. Unless we obey the law of Nature, we must bear the penalty, and perish, and not forget that although "Man is the favourite of Nature, not in the sense that Nature has done everything for him, but she has given him the power of doing everything for himself." I am fully cognizant of the arduous and multifarious duties the municipal engineer has to perform, the practicability he has to bring to bear upon his work, and the business tact he has to exercise to establish his position, not only for the first year of his office but from year to year, as his council becomes reformed. Every twelve months brings with it newly-elected town councillors, loaded with fads to interrogate the officers, often on trivial matters, to make himself popular before his constituents. The engineer or surveyor, however, has the confidence of the corporation as a body whom he serves from the fact of his being entrusted with the expenditure of large sums of money, in the carrying out of works under his charge, and also, from the crucial test of his character by the hundreds (in some cases) he has had to compete against in obtaining his honourable position; for it may be said he is not elected by any particular ward of a borough, but by the whole borough. Our worthy and highly-respected past-President, Mr. Lewis Angell, brought the question of protection of the engineer fully before this Association at its formation. It is well known from experience that some authorities are not grateful to the officers who have served a lifetime in the interest of the town, and would fain leave their officials at the mercy of their adversaries, when most of the fathers of the Council, who had known them best, have passed away, and this at the close of a hard-worked official life. Therefore I think the time has arrived when he should be protected by the institution or a superannuation fund or otherwise. It matters little how many authorities he may have served—he is always gaining knowledge to

universally assist in the work of sanitation. The Borough Surveyor has in a great measure to put the law in force, and so strain the feeling of adverse criticism, and at all times to be loyal to his board and firm in the discharge of his duties. His independent and impartial judgment should, therefore, command as much respect as the highest official in the land, for, in my judgment, there is no office where duties are so highly strained—from the large amount of scientific work demanded of him by his employer on the one hand, and from the enforcement of sanitary provisions for the public good on the other.

Mr. Ellice Clark (London) said he proposed a vote of thanks to the President for his address with peculiar pleasure, because at the first annual meeting of the Association Mr. Fowler made some remarks on a paper read by him (Mr. Ellice Clark) which greatly encouraged him. Mr. Fowler had filled a distinguished position as a Municipal Engineer, and his address bristled with points of importance. From one who looked at the matter rather from the ratepayer's point of view, some of the figures given in the address were rather appalling.

Mr. W. Brooke (London) said that as an old Borough Engineer he had great pleasure in supporting his late chief and seconding the vote of thanks.

The proposition was adopted unanimously, and briefly acknowledged by the President.

[We shall continue our report next week.]

The annual dinner of the Association was held on the 21st inst. at the Holborn Restaurant, the President, Mr. A. M. Fowler, occupying the chair, supported by Lord Chelmsford, Sir Robert Rawlinson, K.C.B., Sir Benjamin Ward Richardson, Sir Walter de Souza, Dr. Rentoul, M.P., the Mayor of Leicester, Colonel Edis, and Messrs. Lewis Angell, E. Pritchard, J. Lemon, J. T. Eayrs, F. Ashmead, J.P., C. Jones, E. B. Ellice Clark, H. P. Boulnois, Thomas Cole, Secretary, and others.

The Chairman having proposed the toasts of "The Queen" and "The Prince of Wales and the Royal Family,"

Mr. E. B. Ellice Clark proposed "The Houses of Parliament," coupled with the names of Lord Chelmsford and Dr. Rentoul, both of whom replied.

Sir Benjamin Richardson then proposed the toast of the evening, "The Incorporated Association of Municipal and County Engineers," and in doing so referred to the fact that the Association was this year twenty-one years old, and that in a very few years it had trebled its numbers. It was progressing day by day in firmness and stability. The toast was coupled with the name of Mr. Lewis Angell.

Mr. Angell, in responding, having referred to the founding of the Association, said that they had now 600 members, each one representing a different town and constituency, and therefore their constituency was very large. Until recently their membership had been confined to England and Wales, but latterly they had accepted the sanitary engineers of Scotland and Ireland, and several of their members were Colonial engineers. Mr. Angell then referred to the improved status of sanitary engineers and surveyors within recent years, for he could remember the time when there was no appreciation of sanitary matters and no enforcement of sanitary principles, and the life of a town surveyor who was called upon to carry out new legislation was a very hard one. The object of their Association was to learn and to teach, and for that purpose they went about to different parts of the country, and they had actually visited 300 towns during the last twenty-one years.

Mr. H. P. Boulnois then proposed the toast of "The Local Government Board," coupled with the name of Sir R. Rawlinson, who had been their guide, philosopher, and friend in many ways, more particularly in the issue of his work in connexion with sewage and water-supply.

Sir R. Rawlinson having replied, Mr. C. Jones proposed the toast of "The Visitors," coupled with the names of Sir W. de Souza and Colonel Edis, both of whom replied.

The other toasts were "The County and Municipal Institutions of the Country," proposed by Mr. E. P. Hooley, and responded to by the Mayor of Leicester; "The Past Presidents," proposed by Mr. R. Godfrey, and replied to by Mr. J. T. Eayrs; and "The President," proposed by Mr. J. Lemon.

SALE OF LAND, GOUGH PARK, ENFIELD.—As will be seen from an advertisement which appears in this issue, Messrs. E. & H. Lumley will sell by auction, on July 4, the freehold estate known as Gough Park, Enfield, comprising 59 plots of building land, together with the existing old family residence.



## Illustrations.

NORTHAMPTON INSTITUTE:  
ENTRANCE AND TOWER.

**M**E gave plans and a general view and description of the Northampton Institute in the *Builder* of April 15, 1893, to which we refer the reader. The present illustration is from the perspective drawing of the tower which is at present in the Royal Academy Exhibition. The architect is Mr. E. W. Mountford.

THE TOWER BRIDGE: DRAWINGS OF  
CONSTRUCTIVE IRON-WORK.

THESE drawings, prepared for this journal, represent the iron-work, or rather we should say the steel-work design of the Tower Bridge, without the masonry, which, as described in our first article, is a mere screen having no relation to the construction. Below the general side elevation of the bridge is given a section of one leaf of the opening portion, with the chamber into which the quadrant and the balance portion of the leaf descends when the bridge is opened. For further remarks see the first article in this issue.

## NEW CHURCH, COCKINGTON, DEVON.

THE problem involved in the design illustrated was the provision of accommodation for 600 persons at a cost of 5,000*l*. In order to effect this the building has been kept low and simple and without a clearstory, the type of design adopted being the traditional style of the district. Advantage has been taken of a considerable fall in the ground to place the vestries below the chancel. It is proposed to build the walls of local red limestone in coursed rubble work, with dressings of Douling stone. The walls to be plastered internally, the roof of the local "cradle" type with carved braces to each common rafter and moulded arched principals and purlins. The roof to be in red deal, boarded and slated with small Delabole slates, the windows to be glazed with clear-sanded sheet-glass, the floor of stone paving and wood blocks, and the seating chairs. The cost is estimated at 5,000*l*, without the upper portion of the tower. The architect is Mr. C. A. Nicholson, of London.

The design was selected in an open competition, and, as the editor of this journal was the assessor in this case, it may be added that this design was selected, not as being the best *sans phrase*—an admission which is perhaps due to the authors of another design of exceptional merit which were among those submitted—but as the only good one which could be carried out for the sum stipulated in the conditions; a point on which, in our opinion, an assessor ought to be inflexible. It is to Mr. Nicholson's credit that while designing a church with special regard to economy, he sent in an estimate of its cost which would bear investigation, which certainly was not the case with some others of the competitors.

## SOME SCULPTURE OF THE YEAR.

ALL the works illustrated in this plate are from the sculpture exhibited this year at the Royal Academy, except Mr. Lucchesi's "Oblivion," which is in the New Gallery. They are all referred to further in the article on another page, under the heading "Sculpture at the Royal Academy."

The three upper figures on the plate are all life-size statues; the figures entitled "Knuckle-bones" and "Boy with Pegtop" are large statuettes, about one-third life-size. The design for a knocker is the size of a rather large knocker such as might suit the entrance-yard of a Paris hotel—it is too large for an ordinary house-door. We give it on a much larger comparative scale than the figures, as the detail is rather elaborate and would be lost on a smaller scale, and moreover it belongs to the class of sculpture work which has a more direct connexion with architecture. For the same reason we gave Mr. Schenck's bas-reliefs last week on a large scale, as they are decorative sculpture in a sense in which the figures illustrated this week are not.

**ADAMS' PATENT SEWAGE LIFT.**—In the section given on page 487 *ante*, the lower drain on the diagram was erroneously marked "Sewer above natural outfall." It should have been "Sewer below natural outfall," the upper drain on the diagram being, as lettered, the one "above natural outfall." The mistake was that of Messrs. Adams' draughtsman, not ours.

## THE LONDON COUNTY COUNCIL.

THE usual weekly meeting of the London County Council was held on Tuesday at the County Hall, Spring-gardens, Sir John Hutton, Chairman, presiding.

**Electric Light at Hampstead.**—The Finance Committee recommended that the sanction of the Council be given to the borrowing by the Vestry of Hampstead of the sum of 24,400*l*. towards defraying the cost of an electric light installation in that parish, on condition that it was repaid by instalments of principal, or principal and interest combined, within a period of twenty-five years.

Mr. Harben moved that the time allowed for the repayment should be forty-two instead of twenty-five years.

Dr. Collins seconded the amendment, which after considerable discussion was adopted by 52 votes against 21.

**The Condition of London Bakehouses.**—The Council next considered the adjourned report (which we published last week, page 481) of the Public Health and Housing Committee with reference to London bakehouses. The committee recommended—

"That the Council do endorse the views expressed in this report, and give instructions for a copy of this report and of the medical officers' report to be sent to the President of the Local Government Board, with a request that he will take steps to obtain an amendment of the law relating to bakehouses in the manner here proposed."

Mr. Cornwall moved, as an amendment to the recommendation:—

"That the Council, while concurring in the view that regulations governing the position, structure, and internal arrangement of bakehouses should be made by the Council for the whole of London, is of opinion that the licensing and supervision of bakehouses, and the duty of enforcing the Council's regulations, should remain with the local sanitary authorities, the Council having power to act in their default under section 100 of the Public Health (London) Act, and accordingly refers the matter back to the committee with instructions to communicate with the President of the Local Government Board to ask him to propose an amendment in the law for the purpose."

Mr. Moss seconded the amendment, which was ultimately adopted.

**Proposed Strand Improvement.**—The Improvements Committee again reported in reference to the proposed Wellington-street and Strand improvement. On the 5th inst. the Council resolved to accept the offer of the Duchy of Lancaster to sell for 32,000*l*. the reversion to the freehold property required for widening Wellington-street and the Strand "on the understanding that the reduction of the price from 38,760*l*. to the agreed sum of 32,000*l*. is made in lieu of a contribution by the Duchy in respect of betterment; and that the solicitor be instructed to prepare the necessary agreement with the Duchy, provided that the arrangement shall be subject to the Strand District Board agreeing to contribute one-fourth of the purchase-money." The Committee reported that the Duchy had written refusing to be a party to the "understanding" in question, and that the Strand District Board had written declining to make the suggested contribution. Under these circumstances, the Committee recommended that the resolution of the 5th inst. should be rescinded, and that the Council should decide to effect the purchase, and carry out the improvement without regard to the above-stated conditions.

Mr. Torrance moved "That the Council is not prepared to depart from the conditions with regard to the recognition of betterment and of a local contribution set out in the resolution of June 5; and instructs the Committee accordingly."

Dr. Collins seconded the amendment, which, on a division, was adopted by 50 votes against 38.

**Non-Union Labour.**—In reply to Mr. Cohen, M.P., Mr. Ward (Chairman of the Works Committee) said he had seen the statement in the Press that a man who had sought employment in the Works Department had been told by the foreman that he could not be taken on unless he belonged to the Building Trade Federation. The foreman, however, denied that there was any truth in the allegation. Other statements of a similar character had been made, but as they were still being investigated he could not absolutely deny them at that moment. His Committee had on the previous day received a deputation of the Free Labour Association, and the members of the deputation withdrew the suggestion that non-union men were refused employment by the Council, and admitted that a number of men who

belonged to no trade organisation were in its employment.

**Proposed New Asylum.**—The adjourned report of the Asylums Committee in reference to a proposed new asylum was submitted, the Committee recommending:—

"That in accordance with section 239 of the Lunacy Act, 1890, we be now authorised to provide the sixth asylum, and subject to the usual estimate being submitted to the Council by the Finance Committee, to incur a preliminary expenditure of 2,000*l*."

Mr. McDougall, in commenting on the great cost of Claybury Asylum, a place which, he said, was much too ornamental and sumptuous, said he wished to move as an amendment that, instead of obtaining plans and estimates for the new asylum in the manner proposed, they should obtain the services of a man who should be under their control, to visit existing asylum buildings for the purpose of seeing the good and bad points of those buildings. The good points could then be incorporated in the plans for their proposed new building. The services of such a man would be required even after this, the sixth, asylum was erected, for it was calculated that a new asylum would be required about every three or four years.

Mr. Beachcroft seconded the amendment, but the consideration of the question was adjourned until next week. The Council adjourned at half-past seven o'clock.

## COMPETITIONS.

**BATHS AND WASH-HOUSES, MARYLEBONE-ROAD, N.W.**—The competition for baths and wash-houses, Marylebone-road, N.W., has just been decided as follows:—1st premiated design, 100*l*., Mr. John Johnson, 9, Queen Victoria-street, Mansion House, E.C.; 2nd premiated design, 60*l*., Mr. A. Saxon Snell, 22, Southampton Buildings, Chancery-lane, W.C.; 3rd premiated design, 40*l*., Messrs. Ardron & Cheers, 39, Victoria-street, Westminster. Mr. Charles Barry, of Westminster Chambers, was the assessor.

**"PARK" FEVER HOSPITAL.**—Mr. Edwin T. Hall, whose plan obtained the first premium in the recent competition for this hospital, has been duly appointed by the Metropolitan Asylums Board as the architect to carry out the work. As we have already said, the plan is an exceptionally good one as a combination of separation in disposition of the wards with concentration in working.

**ASYLUM, WINWICK, LANCASHIRE.**—The competition for the Winwick Asylum, Lancashire, has resulted as follows:—1st Premiated Design, Messrs. Giles, Gough, & Trollope, 28, Craven-street, London, W.C.; 2nd, Mr. G. T. Hine, 35, Parliament-street, London, S.W.; and 3rd, Messrs. Henry Crisp & Oatley, 27, Clare-street, Bristol.

**SCHOOLS, LLANGIBBY, NEWPORT, MON.**—The result of the competition for schools for eighty children at Llangibby has just been made known. The first premiated design is by Mr. W. H. Dashwood Caple, 1, St. John's-square, Cardiff; and the second is by A. Castings, 8, Craig's-court, London, S.W.

**THE BUILDING TRADES FEDERATION.**—The second annual demonstration and mass meeting of the London Building Trades Federation was held on the 24th inst. in Hyde Park. A procession was formed on the Thames Embankment shortly before 2 p.m., in which trade unions and societies connected with the building trades took part. The procession left the Embankment soon after 3 p.m., and marched by way of Great George-street, Birdcage-walk, Buckingham Palace-road, and Grosvenor-place to Hyde Park, where five waggoners served the purpose of platforms. At No. 1 platform Mr. J. Batchelor (general secretary of the Operative Bricklayers' Society) presided; at No. 2, Mr. A. Otley (general secretary of the National Association of Operative Plasterers); No. 3, Mr. A. Humphrey (general secretary of the Navvies' Union); No. 4, Mr. W. Stevenson (general secretary of the United Builders' Labourers' Union); No. 5, Mr. E. C. Gibbs (general secretary of the Amalgamated Society of House Decorators and Painters). The following resolution was unanimously adopted at each platform:—"That this mass meeting of building trade workers considers the time has arrived for the return of members of the building trades on all local and municipal bodies within the London district to press forward the enforcement of the provisions of the agreement of June, 1892, by the insertion of the trade union clauses in all contracts; and, further, we pledge ourselves to use every legitimate means at our disposal for the direct employment of labour, under trade union conditions, by all local and municipal bodies."

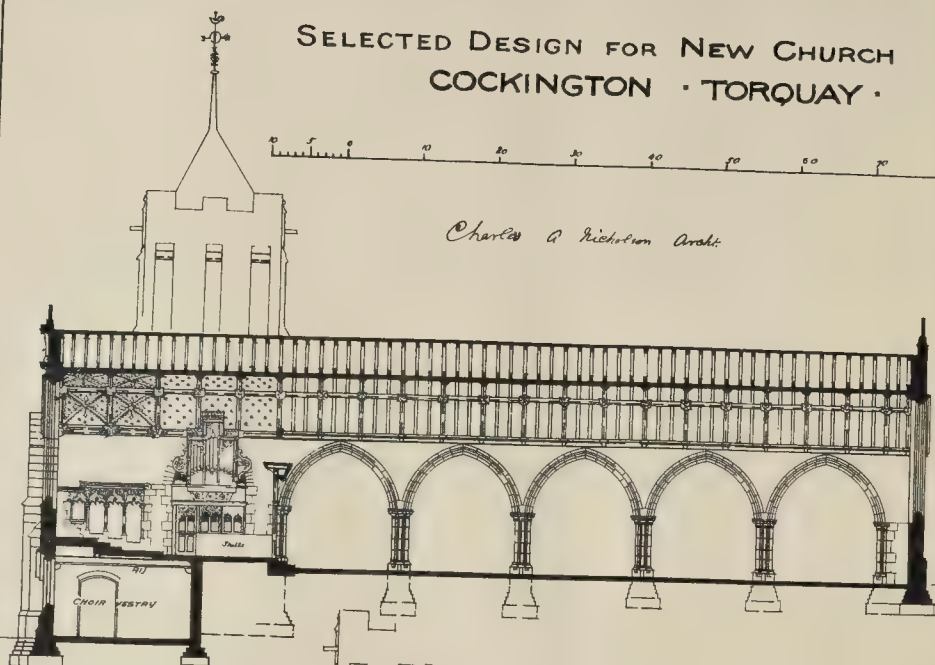




# SELECTED DESIGN FOR NEW CHURCH COCKINGTON · TORQUAY ·



*Charles A. Richardson Architect*

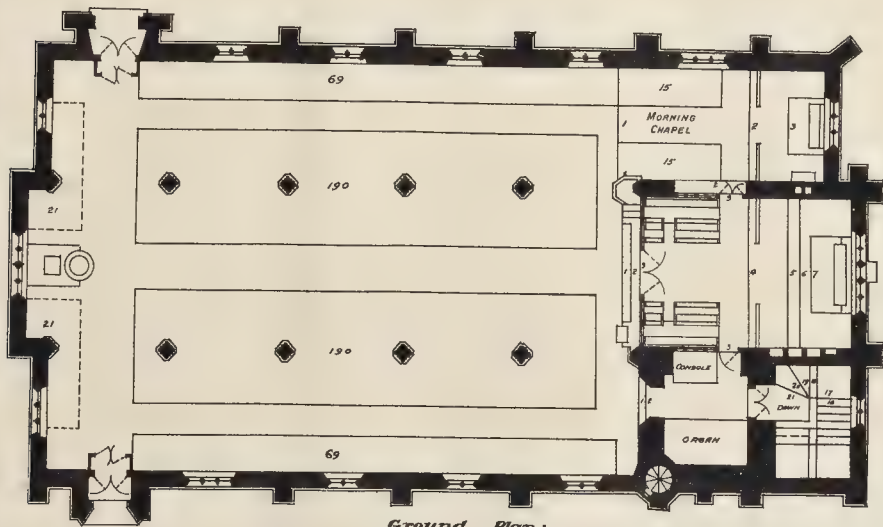


Section

## Accommodation

Nave and	Central Blocks	-	380	
aisles	Side	-	138	
	Choir at West End	-	42	
Chancel	Morning Chapel	-	90	
	Chair	-	10	
	boys	-	12	
			<u>672</u>	Total





Ground Plan.

PHOTO L. THO. SPRAGUE & CO. 4 & 5 EAST HARDING STREET FETTER LANE E.C.







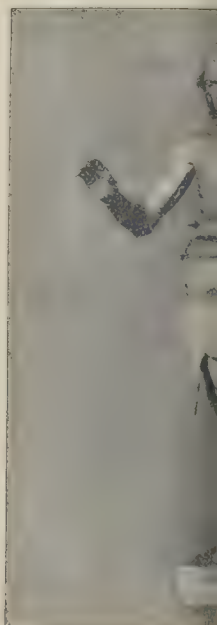




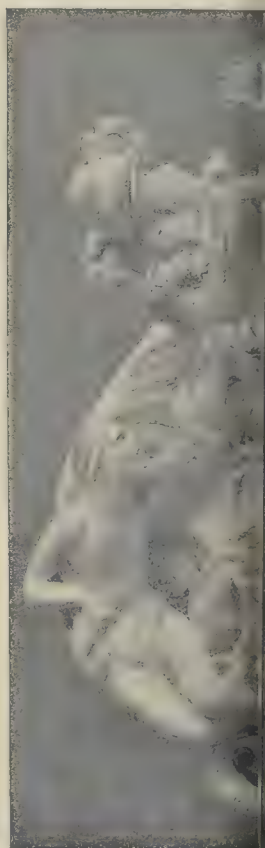
"OBLIVION" A. C. LEFFERT



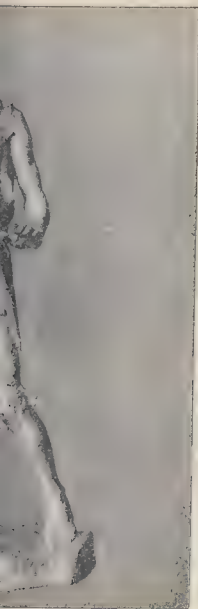
"KNUCKLE BONES" G. NATROP



"ST JOHN THE BAPTIST"



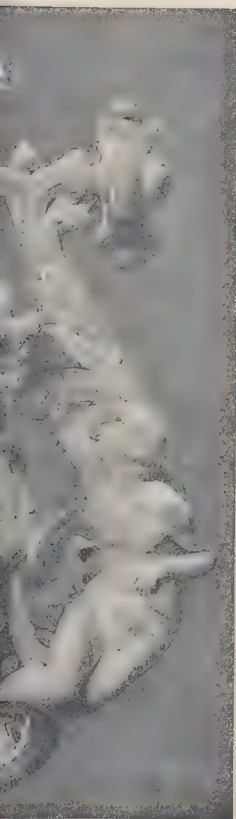
"DESIGN FOR A"



V. GOSCOMBE JOHN



"CIRCE" MERTA MAGNENAU



"C. J. ALLEN.



"BOY WITH PEG-TOP": E. ROSCOE MULLINS.

INK PHOTO SPRAGUE & CO. 46 5 EAST HARDING STREET FETTER LANE E.C.





## Books.

*Speeches and Addresses of Edward Henry, Fifteenth Earl of Derby.* Selected and Edited by Sir T. H. SANDERSON, K.C.B., and E. S. ROSCOE. London: Longmans, Green, & Co. 1894.

THE greater part of these volumes naturally deals with subjects which are foreign to our columns. They are brought within our scope, however, by the fact that the speeches reported in them touch occasionally upon sanitary and artistic subjects. In the first volume, for instance, we find one "Hospitals," another on "The Restoration of Ancient Buildings"; others touch on "Sanitary Questions," on "The Purchase of Railways by the State," and (in the second volume) there is even an address on "Art," and another on the not quite unrelated subject of "The Smoke Nuisance." The late Lord Derby was a man of very wide interests and sympathies, and it is worth while to notice what were his ideas on these several important subjects. On the question of hospitals Lord Derby's most trenchant saying is that of all human institutions a well-managed hospital is the least liable to abuse; "no one who has been treated for a broken leg ever wishes to break it again merely for the pleasure of being cured"; an argument for the support of hospitals which is obvious enough, but has not always been so effectively stated. The short speech on "the restoration of ancient buildings" (so named in the list of contents, though in the body of the work it is entitled on the "preservation" of ancient buildings, which is a rather different thing), is a somewhat curious appeal made in connexion with the meeting in 1870 "to promote the restoration of Chester Cathedral," on the ground that "of all memorials of antiquity, architectural work is the most durable and that upon which there can be the least of either deception or mistake"; therefore, the meeting addressed were encouraged to subscribe towards the object of making Chester Cathedral a complete deception, and of altering it from a genuine second-class Medieval cathedral, in a rather dilapidated state, to a modern church with the stamp of Scott upon it, at least as far as the exterior is concerned. Certainly, there is here that at which the cynical may smile. The short address "On Art," was delivered at the opening of the School of Science and Art at Oldham, and contains some sensible as well as hopeful words in regard to the unquestionable increase in artistic interest and perception in the present day, especially in relation to architecture. The short address on the mitigation of the smoke nuisance is one of the best and most comprehensive statements of the position that we have read, in regard to the duty of each to do what he can to mitigate a nuisance which affects all, and the practical wisdom of trying, before we ask for more legislation, to enforce thoroughly the laws we have. Equally practical and to the purpose is the remark in the address on "Technical Education" (Preston, 1889), that whereas facts, figures, or definitions may be merely swallowed down or forgotten, we never lose what we have learned to do. "The books read at school leave a very dim impression after twenty or thirty years; but nobody who has learned to ride, to row, to swim, to skate, to play cricket, or to speak a foreign language, ever entirely forgets his skill. . . . I suppose it is the same with drawing, with music, and with all other work in which the hand has a share as well as the head." It would be difficult to put the case for technical education in a more pithy manner.

*Les Artistes Célèbres: Canaletto; par ADRIEN MOUREAU. Bernard van Orley; par ALPHONSE WAUTERS. Constant Troyon; par A. HUSTIN. Michel van Mierevelt et son genre; par HENRY HAVARD. Paris: Librairie de l'Art. 1894.*

THESE are four more of the series of excellent illustrated biographies of artists published under the patronage of the French Ministry of Public Instruction and Fine Arts, a good many have been previously noticed, in our columns. The most specially interesting to us is the one on "Antonio Canal, dit le Canaletto," who is treated of in this book mainly as a painter of Venice, in which light no doubt he is principally famous; but something might have been said as to his work in London, to which we do not see any reference. A considerable number of his Venetian scenes are illustrated in engravings which are somewhat too rigid and precise in style for the

nature of the subject; though it may be said that Canaletto himself was a rather hard and unimaginative painter, and did not attempt much beyond realism. It is this quality, as M. Moureau observes, that in the present day gives a great deal of value to his works, as the evidently conscientious representation of architectural combinations which have been a good deal altered by time and constructional changes. Some little space is also assigned to notice and illustrations of his follower Guardi.

Troyon is a greater name, though the interest of his work is less unique than that of Canaletto. No one, however, has been more successful than Troyon in combining the excellences of landscape and cattle painting, and raising pictures of this class into the region of poetic sentiment, while his grand and broad method cannot be too highly praised. Owing to this quality his work lends itself well to illustration by engraving, and some of the illustrations, such as that of "Le Départ pour le Marché," are excellent. We could have wished that, as such a good illustration is given of his "Chien d'Arrêt," equal pains had been taken with his finer work, "L'Œil du Maître," exhibited a good many years ago in London under the title of "The Sheep Dog"; this is one of the finest things he ever painted, and might well have deserved better illustration than the small and inadequate block devoted to it. In general, however, the life is well illustrated, and a very pleasing portrait of the artist forms a frontispiece.

The life of the Delft portrait painter, Mierevelt, is illustrated by a number of reproductions from the fine set of engravings in the Cabinet des Estampes of the Bibliothèque Nationale. This study of a painter whose works are not popularly known in England ought to interest English readers. Bernard van Orley of Brussels, still less known here, was a decorative painter of religious subjects of some importance in his day, and worth commemorating, though we are inclined to think his biographer exaggerates him a little. All four of the books, however, are valuable additions to this admirable series of biographical and illustrative sketches.

*The Gods of Olympus; or Mythology of the Greeks and Romans.* Translated from the twentieth edition of A. H. Pictorius, by KATHERINE A. RALEIGH, with a preface by JANE E. HARRISON. London: T. Fisher Unwin.

FAMILIARITY with the characters of Greek mythology is indispensable for a right understanding of Greek sculpture and vase-painting. The book translated by Miss Raleigh has been rendered more valuable for the English reader by two processes, of excision and addition; passages of mere theoretical surmise (in which German critics delight) being cut out, and references to authorities and illustrative passages in ancient poetry being added. The book is largely illustrated with reproductions from antique sculpture, and forms one of the best and most readable repositories of the subject which is within the reach of the general reader.

*Elementary Metal Work: A Practical Manual for Amateurs and for Use in Schools.* By CHARLES GODFREY LELAND. London: Whittaker & Co., 1894.

THIS is a good and suggestive little book, though it must be admitted that the author seems so thoroughly satisfied with himself, and so convinced that he is an important pioneer in artistic education, that he really leaves little for us to say. The practical processes of treating metals are well described, and the designs given as examples are many of them very good, especially those dealing with the simpler forms of work ("making rings and curves into objects," &c.). We do not know whether we should be quite so pleased with all the rest as the author seems to be, but they are above the average of text-book designs. In regard to stencilling, by the way, we were certainly not aware that the gaps in the painting left by the "ties" of stencil "are generally painted out after the colouring." We have never known such a practice in good work; and if indulged it is a great mistake. Stencil work should appear as such, and the stencil plates be so designed as to have a good effect without any subsequent finishing up. Therein consists the true art of stencil decoration.

*Wood Carvings from the South Kensington Museum.* Edited by ELEANOR ROWE. Folio V. London: Sutton & Co.

THIS is another portfolio of the excellent selection of photographs from wood carvings in the

South Kensington Museum, edited by the manager of the School of Art Wood Carving. It contains a number of very fine examples of Renaissance woodwork, mostly French and Italian. There is no plate that is not of interest, but we may mention especially the fine female figure (French work): holding a heart, shown in two positions; and the Spanish cabinet shown in the two succeeding plates, an admirable and very unusual piece of design.

*Selections of Ornamental Ironwork, from the Collection recently acquired for the South Kensington Museum.* The Arts Co., Derby. THIS is a portfolio of admirable photographs, taken under the direction of Mr. T. C. Simmonds, Art Director the Arts Company of Derby, from various examples of ancient ironwork in the South Kensington Museum. They form a useful and interesting collection of examples of ancient ironwork, most of which require no explanation as to style or object; at the same time we may point out that a portfolio of illustrations such as this is much more useful and convenient if the description and date (as far as known) appears at the foot of the plates, instead of a mere number reference to some separate catalogue or index, which is not included in the portfolio sent to us.

## TRADE CATALOGUES.

MESSRS. CROMPTON & FAWKES, of Chelmsford, send us their illustrated catalogue of horticultural buildings and heating apparatus. Many of the illustrations are photographs from executed works; to which are added practical sections of various types of conservatory and plant-house, and details of heating apparatus.—From Messrs. T. R. Boote we have a large illustrated catalogue of tile-floors shown in colour, with a variety of designs, all of which however are of the class of arrangements of geometrical patterns, mostly employing squares and diamond shapes, which arise naturally out of the character of the material. There is a certain sameness about these, but they represent the class of pattern best suited for floor-tiling.—From Messrs. John Hocking & Sons we have a catalogue of grates and ranges, various forms of stove, flushing cisterns, gutters, &c.—The "Continental Traveller," the official time book and guide of the "International Sleeping-Car Company," contains a number of time-tables and information as to fares, &c., for Continental travelling.

## Correspondence.

To the Editor of THE BUILDER.

## SEWER AND DRAIN VENTILATION.

SIR,—My letter on page 447 of your issue of the 9th inst. was written before I attended the meeting of the Association of Municipal and County Engineers at Torquay, reported in the same number, and I was not then aware that the discussion at Torquay would turn upon the above subject. As I expected, I have incurred the condemnation which Mr. Buchan reserves for all who differ from him, but I have no desire for "notoriety" and only want this question discussed without prejudice upon a broader basis than that of the individual drain owner, to whose selfish instincts the idea of being "cut off from the sewer" appeals so strongly.

It has always been contended by the advocates of "interceptors" that they are no obstruction to the flow of sewage from the house drain, but they admit that they interfered with the ventilation of the sewers, and fall back on the "dog-in-the-manger" principle that the sewers belong to the authorities, who must ventilate them as best they can without help from the house-drains. I have always contended that the sewers and drains form one complete system, both for removal of sewage and for ventilation, and the individual owner should assist, and not obstruct, their free use for either purpose, it being to his own advantage to do so.

Keeping this in view, it is of the greatest importance that both drains and sewers should be laid to the best possible gradients, free from all unnecessary obstructions, and be provided with efficient flushing apparatus in order to reduce the sewer and drain air to a standard of quality which can be easily and safely dealt with by free ventilation properly applied. This can only be done by united action between drain-owners and the authorities.

The drains discharge intermittently, but being numerous, and in the aggregate about four times the length of the sewers to which they are connected, cause a continuous flow through the sewers, but the amount of this flow varies considerably during each twenty-four hours; about half the daily flow is discharged during the six hours from 9 a.m. till 3 p.m., while the minimum flow occurs between midnight and



6 a.m.; these fluctuations alone cause a displacement, or slow breathing action of the sewer-air, and if, in addition, rain occurs, it is quite possible for a system of sewers to run both one-third and two-thirds full within six hours or less, thereby displacing nearly the whole aerial contents. The displaced sewer-air, be it good or bad, must find vent somewhere outside the sewer, and its quality depends, firstly, on the amount of deposit in the drains and sewers; and, secondly, upon the amount and character of the ventilation; the amount of deposit in turn depends upon the gradients, the obstructions, and the amount of flushing, natural or artificial.

The sewer-air has a natural tendency to rise against the crown of the sewer independently of the vertical compression by the rise of sewage, but the velocity of flow of the latter causes friction between the surfaces of air and water in contact, and therefore more or less of the sewer air always follows the flow down the sewer as the velocity increases or decreases, but the friction of the air against the crown of the sewer acts as a drag, and in a very large sewer it is possible to have two currents of air in opposite directions at the same time, one above the other.

The tendency to motion is increased or diminished by numerous natural causes, such as variations of pressure, and temperature, of the outer air, and the action of the wind upon openings in the drains and sewers.

The flow in the sewers being continuously in one direction, is usually sufficiently strong, in all ordinary sewers, to carry a large proportion of the sewer air with it, and this being the most permanent factor in the problem, the ventilation should be arranged in harmony with it. Every discharge from the house-drains accelerates this motion by driving the drain-air before it into the sewers in the direction of the flow, but immediately the discharge from the drain ceases, the sewer-air enters the length of drain between the sewer and the "interceptor" and stagnates there, if the latter is not ventilated on the sewer side, and as the sewage rises in the sewer the stagnant air is forced through the "interceptor," and out through the soil-pipe ventilator shaft, the bubbles of sewer air passing the "interceptor" much in the same way that the bubble of air in a spirit level travels from one end to the other.

On passing under a street-grating at a man-hole or lamp-hole, in the absence of any contrary influence, the sewer air will pass up it also to escape the drag of the flowing sewage.

During the last forty years, but more especially during the last twenty years, nearly every town in England of any importance, has been sewered, or re-sewered, by experts who have taken advantage of the natural features of the district, to give the sewers the best possible gradients, with special arrangements for flushing those which are known to be unavoidably flat-graded; and also during the last twenty years a large number of house drains have been constructed, or re-constructed, by other experts who have introduced a legalised obstruction in the form of an unventilated trap, called an "interceptor," which produces what is practically a back fall of 2 in. in its length of 2 ft., and to overcome this obstacle they waste, in vain, 3 in. of the fall belonging to the upper part of the drain above the "interceptor"; the result is, that the latter retains 35 per cent. of the solid matter passing it, and also, to quote from a recent circular issued by a company who manufacture these traps, that "stoppages frequently occur, and entirely fill the (disconnecting) chamber, and it is either necessary to pump or bale out the sewage before an entrance can be obtained to unstop the drain."

The experiments of the Sanitary Institute are all the more valuable from the fact that they were not specially undertaken to show the obstruction caused by the "interceptor," but it was only the last of three points considered, viz. 1. The effect of the flush in removing solid matters from 50 ft. of 6-in. drain, laid with a gradient of 1 in 40, was as follows:—

Drain 1 in 40.	In Closet Trap.	In Drain.	In Interceptor.
2-gal. Flush, retained..	5	14	35 per cent.
3-gal. Flush, retained..	1	4	27 "

The amount retained in the straight drain, if not caused by the presence of the interceptor at the end of it, was the result of a bad form of closet-pan and trap at its commencement, as will be seen on referring to the figures given for the 50 ft. of 6-in. drain, laid with a gradient of 1 in 30—that is, with 5 in. more fall in the length than the 1 in 40, the closet-trap retained the same percentage in both cases, but the drain figures were reduced in a much greater ratio than those of the interceptor, as follows:—

Drain 1 in 30.	In Closet Trap.	In Drain.	In Interceptor.
2-gal. Flush, retained..	5	9	33 per cent.
3-gal. Flush, retained..	1	1	20 "

The experts who fix these interceptors in the house drains don't know how often they cause a stoppage, because, unless the stoppage is a serious one, the head of water accumulating in the disconnecting

chamber above the trap, will probably clear it, without the owner being aware of the accident, but should a serious stoppage occur, the owner, having a wholesome dread of further expense, does not trouble the expert again, but sends for an intelligent labourer or "handy man" to clear it.

The practice at Torquay of ventilating the sewer side of the interceptor is a great concession, and, as I said at the meeting in reply to a question by the President, it is, in my opinion, the only condition under which interceptors should be allowed to be fixed, but it does not alter the fact that they are obstructions which cause deposit, manufacture sewer gas, and throw an unfair and unnecessary amount of work and consequent discredit on the ventilation.

No doubt the excellent gradients obtainable at Torquay for the house-drains to a certain extent discount the obstruction caused by the interceptors, and I daresay the death-rates, both ordinary and zymotic, are low, although unfortunately neither were given in Mr. Garrett's paper.

It speaks volumes for the fine climate and other natural advantages of Torquay, not to mention the persuasive powers of the Borough Surveyor, Mr. Garrett, that the good people of Torquay, after being legally compelled to put in more than 2,000 interceptors, at a cost of say at least 1,000*l.*, have, without any legal obligation to do so, erected 2,000 or more duplicate shafts on the sewer side of the interceptor, at a cost of another 3,000*l.* more, to enable the ventilation to minimise the dangers of the obstructions caused by the said "interceptors."

Your correspondent "Sanitas" should read my letter again, he has mis-read it.

The drain defects mentioned by Mr. C. H. Sutter would be equally dangerous, interceptor, or no interceptor, and do not affect the argument one way or the other. The continuous grating, he suggests, over the sewers in the street would be a very good way of filling them with road dirt, but what is wanted is, to reduce the street gratings to a minimum, both in numbers and size of openings, in order that the velocity of the air entering them should be sufficiently strong to resist being reversed.

Mr. Grantham is a well-known engineer, and is apparently on my side, but is a little bit shy of saying so. It would be interesting if he would kindly give further particulars upon the subject as it is treated in Memphis, U.S.A.

Mr. Bernard Dickes is an able and courteous opponent, who is anxious like myself to arrive at the truth. I have already partly answered him, but as regards 4-in. drains as compared with 6-in. I would point out that the Sanitary Institute experiments include a series with a 4-in. drain, but they do not compare favourably with the 6-in. The 4-in. may be theoretically sufficient, but in practice I prefer a 6-in. main drain with 4-in. branches.

Mr. Ernest Van Patten, A.M.I.C.E., shows that the absence of interceptors at Lewisham has certainly done no harm, and has not been attended by the direful results predicted by Mr. Buchan, or the death-rate would not be so low as 12.4 per 1,000, and I am much obliged to him for such a strong argument in my favour.

I may also quote the case of Frankfurt-on-Maine, one of the healthiest towns in Germany, sewered by the late Mr. Joseph Gordon, C.E., twenty-five years ago on this principle, but on his removing to Leicester he was fettered by the by-laws in force there, and obliged to adopt the interceptor, although he by no means took it for granted as so many people do on that account.

The fact is that a good "wash-down" pan and trap closet, with a soil pipe ventilated 4 in. diameter, is a much more perfect sewer than Mr. Buchan and others would have us believe, for it never keeps out the cumulative results of the 35 per cent. of solids deposited in the "interceptor," plus the sewer gas which is returned at frequent intervals through the "interceptor," from the unventilated length of drain between it and the sewer, and if it will do all this, What is the use of the "interceptor"? I say, none at all, it is a useless, costly, and dangerous obstruction, and should be abolished.

June 25, 1894. R. READ,  
City Surveyor, Gloucester.

#### MR. NORMAN SHAW'S SYSTEM OF HOUSE DRAINAGE.

SIR,—Being interested in town property drained on this plan some fifteen years ago, and having had to modify in various ways its details to suit objections of tenants, and anticipating notices from the sanitary department of one South London parish requiring its entire removal, I think it would be of general interest if some of your readers would give their experience upon the subject, and afford information as to what extent it is being superseded, upon notices such as I refer to, by vent-pipes, upon the system required by the London County Council by-laws.

The ruthless way in which orders are made for the latest ideas in the Sanitary catalogues to be adopted and applied to small and poor property upon the most trivial allegation of defect, is a serious matter for the parties interested, and a year's accounts show often no credit balance.

The matter is one which will bear discussion in your columns.

June 27.

E. W. HUDSON.

#### THE LONDON COUNTY COUNCIL AND TRADES' UNIONS.

SIR,—I trust you will afford me space to answer Mr. Holloway's letter, which appeared in your issue, and in order to prove the statements which I made concerning Mr. Moore's experiences at the Works Department of the London County Council I am enclosing herewith a copy of his signed and attested statement, the original of which can be seen at any time at this office. Mr. Moore would certainly have attended the deputation, but was unable to leave his post, as he was that day expected to visit the surveyors of the works on which he is general foreman.

So far from there being any personal feeling in my remarks at Foresters' Hall, the very reverse was the case, as Mr. Holloway had treated my inquiry in a courteous spirit, and I purposely referred to this on the evening in question.

F. J. ROGERS.

\* See our Note on page 494.

#### HOSPITAL SUNDAY FUND.

SIR,—My attention has just been called to a statement in your paper of the 16th inst. commenting on the expenses incurred in raising and distributing the money collected on Hospital Sunday.

It is to be regretted that the writer of the article did not make some inquiries at the office, when the questions raised would undoubtedly have been answered to his satisfaction.

1,000*l.* was retained at the Bank of England for the purpose of meeting the monthly expenses for surgical appliances during the coming year, 1,883*l.* 4*s.* 6*d.* having been appropriated in this way in 1893. More than half of the 1,600*l.* expenses is paid away for rent, advertisements, printing, and postage; the remainder is paid to a secretary, two permanent clerks, and for occasional extra assistance. Before the distribution is determined, inquiries have to be made in almost every case, and the general correspondence is rarely less than fifty letters per day. The managers of the Fund have always prided themselves on the economy of the administration, which a detailed investigation would undoubtedly justify.

SYDNEY H. WATERLOW,  
Vice-President.

#### SCIENCE AND ART DEPARTMENT EXAMINATIONS.

SIR,—Would you kindly allow me a short space in your valuable paper to express my views with regard to the recent Science and Art Department Examination in "Honors Building Construction," held in May. It is evident that this year was practically a mere race in draughtsmanship, and only those who fortunately scrambled through the whole eight questions were asked to sit at the final examination.

Now I contend that no intimation was given beforehand of the necessity of answering the whole number of questions, but on the contrary we were left to believe by the instructions on the examination paper that more marks could be gained by "full and correct" answers to the questions attempted than by incompletely answering the full number. I think that some little consideration might be shown to the candidates in order that they might run no risk of failing through working under misleading directions.

Thanking you in anticipation for this insertion, I beg to subscribe myself

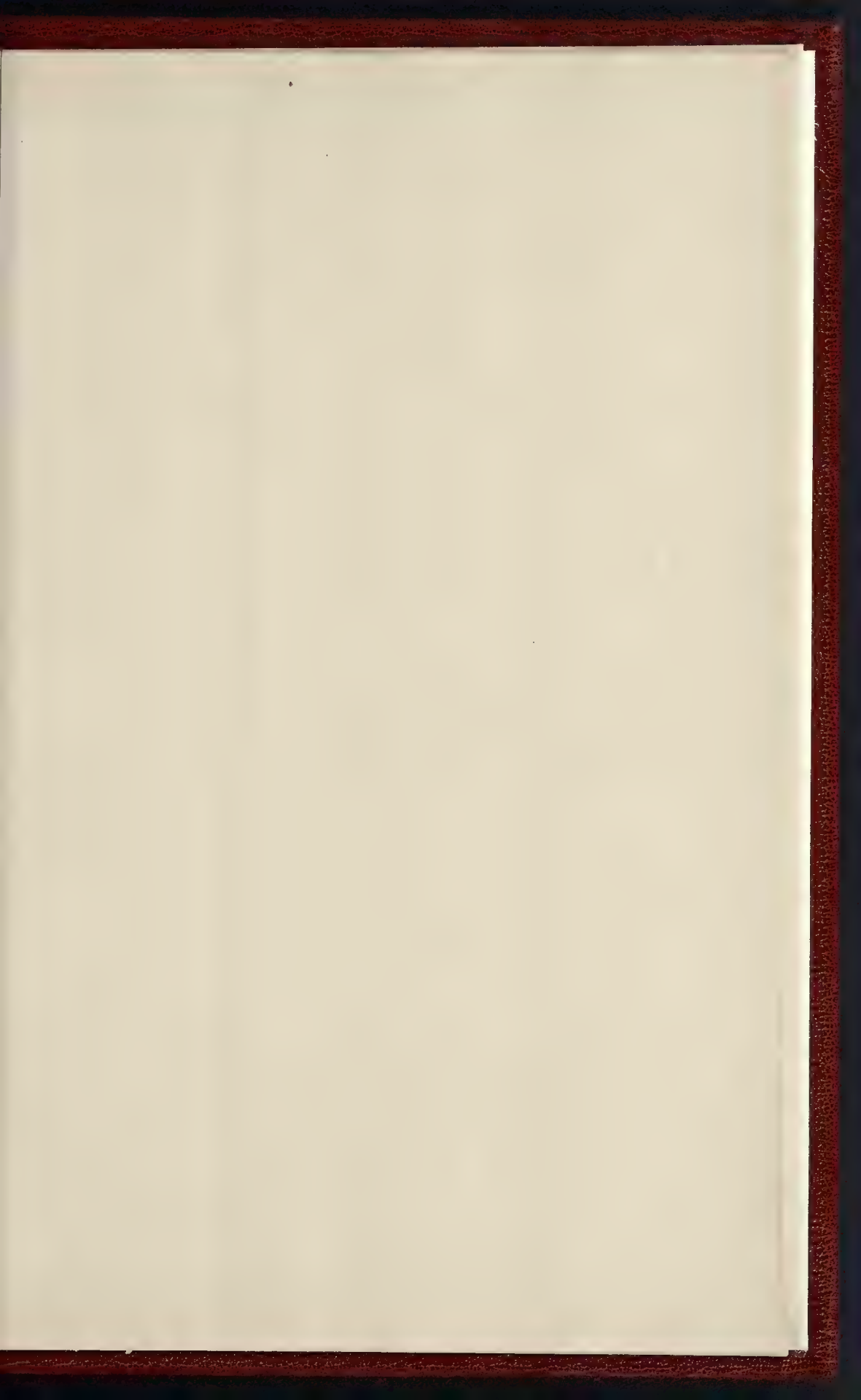
"ONE OF THOSE MISLED."

#### The Student's Column.

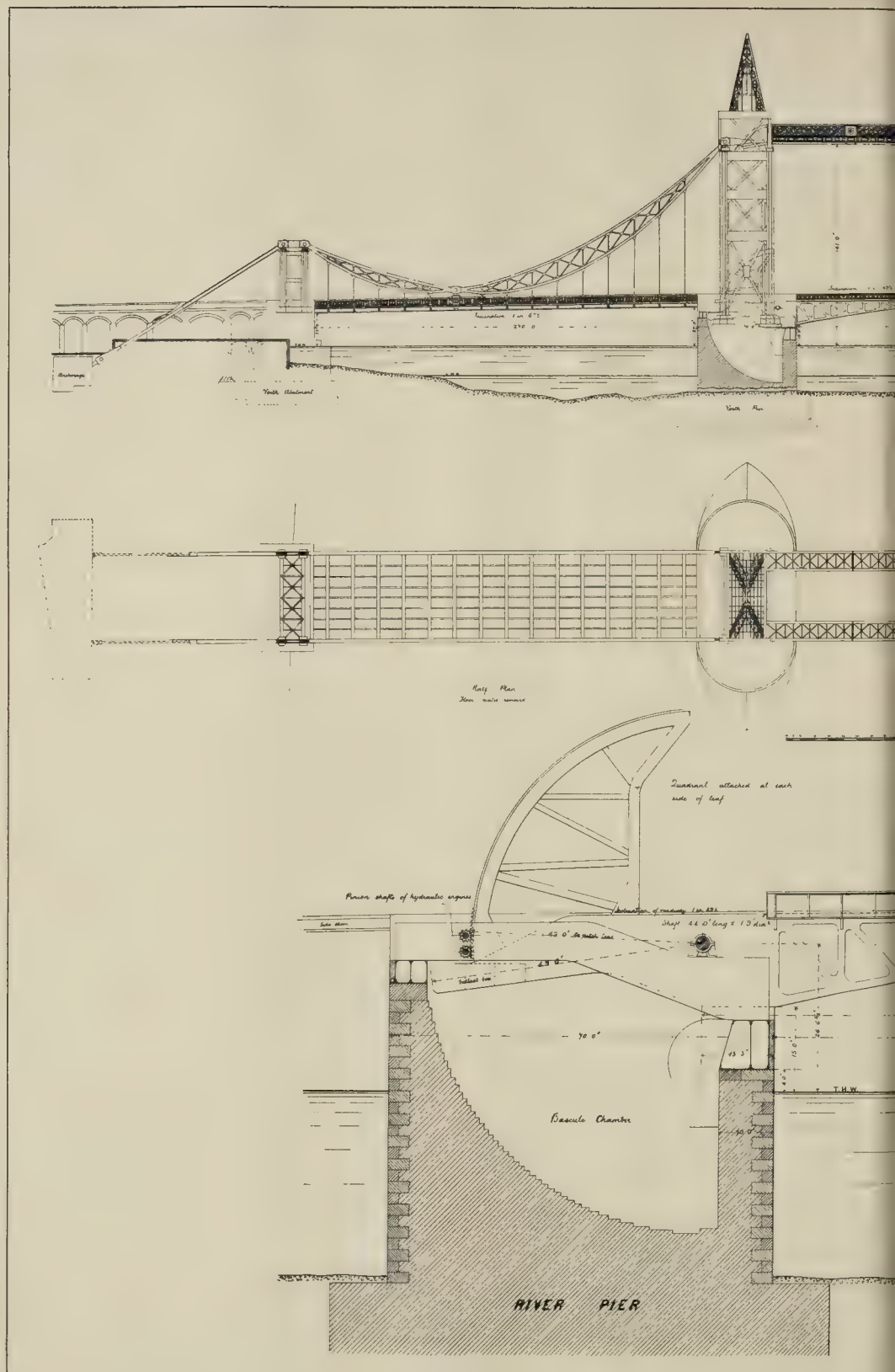
#### THE STRUCTURE AND PHYSICAL PROPERTIES OF BUILDING STONES.—XXVI.

SANDSTONES.—(Continued.)

THE vicinity of Hexham, Northumberland is noted for its sandstones. The Gunnington Quarry, Barrasford, situated in the Yoredale Series, yields a light yellow stone of fine grain and medium hardness, and Purdovan Quarry, near Fourstones, gives us a yellow medium-grained stone. Near Bellingham, in the same county, the Cragg Quarry, likewise produces a yellow stone, fine-grained and very hard and apparently of great durability; whilst at Doddington Quarry, near Wooler, the Calceiferous Sandstone (a member of the Carboniferous Series) is of a pink tint, hard and very compact, also of good material so far as its weathering qualities are concerned.







THE TOWER BRIDGE GENERAL ELEVATION AND PLAN OF THE CONSTRUCTION

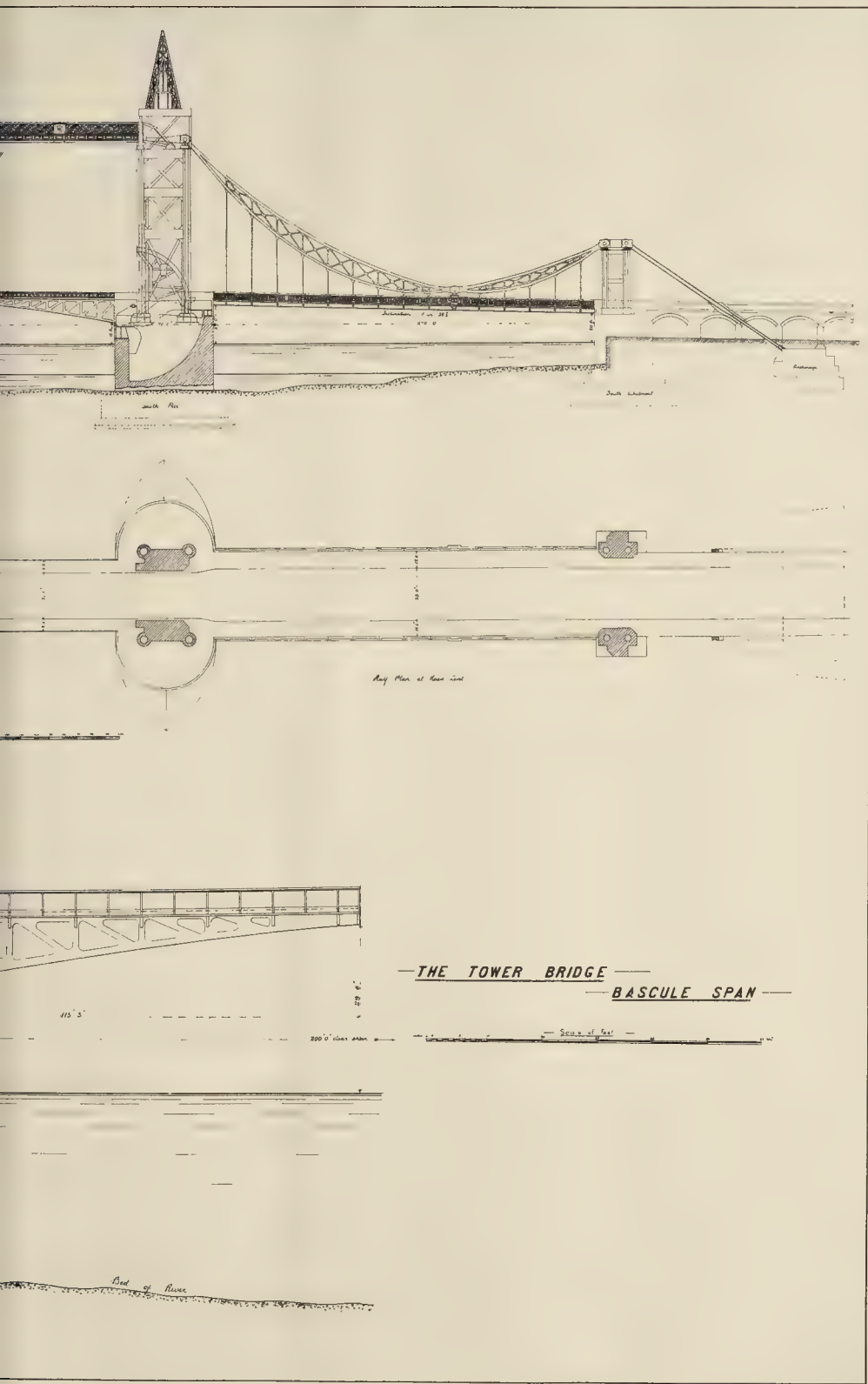


PHOTO LITHO SPRACKE & CO 4 & 5 EAST HARDING STREET FETTER LANE E.C.





Durham possesses many sandstones, those raised at Baxton Bank, Marwood, and Shipley yielding good flags.

Yorkshire sandstones are amongst the most noted of building materials quarried in England. On former occasions we have described in some detail those coming from Scotgate Ash\* (Pateley Bridge) and from the vicinity of Halifax†. The former locality produces a great variety of stone, but the six following are the most important kinds:—

1. Green Crag. A laminated dark greenish brown stone with minute specks, used principally for window-heads, sills, coping, &c.

2. White Crag. Compact, light brown stone, similarly speckled, used for landings, steps, paving, &c.

3. Bottom Bed. Rather more micaceous, used also for monumental purposes.

4. Block Stone. Fine-grained, brown, largely used for the better class of masonry and for monuments.

5. Rag. Laminated, with layers of mica, suitable for bases, &c.

6. Grit Stone. Coarse-grained, with clear transparent quartz grains, principally used for dock walls and cheap masonry.

The quarries described in the neighbourhood of Halifax included the Northwram, Hipperholme, Lightcliffe (Hill Top), Lightcliffe (Harley Head), Southwram, Brighouse, Raistrick, Elland Lower Edge and Upper Edge and Barksland. Other quarries in Yorkshire are at Castlefields, Clayton, Guide Moor (Allerton), Idle Moor, Langmere, Pinfold, Burtsett, West Witton, and Stagsfell. The micro-structure of these stones may be summarised as follows: They are chiefly composed of fragments of quartz, kaolin and mica varying in size and bound together either by some form of iron, or by silica, greatly compacted by pressure. Many are laminated, the laminae consisting of minute plates of mica, which determine the general direction along which the flags are split.

Lancashire is also very rich in sandstones. The following is a list, compiled from official sources, of quarries in the county which come within the operations of the Metalliferous Mines Act:—

*West Lancashire.*  
Bispham, Billinge.  
Crisp Delf, Dalton, Wigan.  
Lawn Delf, Upholland, Wigan.  
*North & East Lancashire.*  
Britannia, Height End and Sand quarries, at Whitworth, Manchester.  
Slate and Pike Law, Haslingden.  
Farther, Greenleach, Turncroft, Rosehill, and Sough, near Darwen.  
Tong End Pasture, Tong End.  
Schofield Hey, near Whitworth.  
Shawforth and Moss, near Rochdale.  
Horncliffe, Crawshaw Booth, and Chapel Hill, near Rawtenstall.  
Scout, Waterfoot.

The produce of the above quarries, in addition to ordinary building stone, consists of flags, grey slate, and pavings.

Other quarries, not coming within the Act mentioned, are very numerous, but we may note those at Harrook Hill, which is a coarse-grained massive grit of grey and yellow tint, and over 100 ft. in thickness; Longridge Fell, medium-grained yellow and grey, which has a good reputation; and Parbold, coarse-grained and massive.

Turning now to the West of England, we may call the student's attention to our former description of the Forest of Dean quarries, and those at Abercarn, Newbridge, Quarella, and Llansyssl. We are able to supplement those observations by some particulars derived from a recent visit to the "Blue Pennant" quarries, near Bristol. The district alluded to is situated to the north of that city, and between it and Mangotsfield, and comprises, in all, seven large quarries, as follows:—Ball's & Payne's Quarries, Frenchhay, Swan-lane Quarry, Frenchay Quarry, Mangotsfield, Overdale and Stanbridge Quarries. About 500 quarrymen and masons are employed on the Carboniferous sandstones of the Bristol coalfield.

The Top Quarry, Fishponds, is an enormous working, about 100 ft. in depth, the average size of blocks being 6 ft. square and from 1 ft. to 3 ft. in thickness.

The material may be described as a dark blue-black stone in the quarry, and when built up it tones down to lighter grey tints, which are its normal tones when quite dry. Under the micro-

scope, it is seen to be almost entirely composed of angular and sub-angular grains of quartz, with but a small proportion of mica and kaolinised matter. Here and there is a slight trace of siliceous matrix, and some form of iron, no doubt a carbonate, is very prevalent, giving its colour to the stone. Occasionally (though not, apparently, confined to any particular beds) the stone is iron-stained, and, judging from the condition of walls and ashlar in the neighbourhood, this is its chief drawback. As would naturally be supposed, the joints are, in most cases, discoloured, and, in this particular quarry, some of the blocks are red throughout—though this is not in any way detrimental, except so far as it implies that inferior blocks may become lighter on weathering, which would militate against any scheme of colouring. Taking the district throughout, the stone may be said to vary considerably in grain, though the greater part of it is very fine. At the Top quarry this sandstone is worked principally by steam power; and the crushing strength of an average block, according to Kirkaldy, is 100,000 tons per square foot.

On arrival at Grant's quarry, Fishponds, we found an enormous opening about 80 ft. in depth, with steam cranes to raise the material and stone saws to cut the same. The whole of the sandstone is of a blue tint and is used for general building and paving purposes. About 60 ft. thickness of the stone is marketable, the uppermost 20 ft. being only suitable for rough walling and the like.

Ball's quarry, Frenchay, though not such a large working as the preceding, contains a considerable quantity of excellent stone, about 40 ft. in thickness, with an overburden of 20 ft. As in many other districts, the size of the blocks is found to increase with the depth of the working. The joints are frequently iron-stained, but the stone is of a deep blue colour.

Speaking in general terms, the Pennant stone has been quarried for centuries. Except in a very few localities, it is exceedingly durable, as might be anticipated from its micro-structure. For our own part, however, we prefer the lighter tinted sandstones for effect in ordinary buildings. It would do admirably for massive London warehouses and the like.

The following are the results of our experiments on certain sandstones, selected from a number to illustrate the variability of the material in regard to specific gravity and absorption of water:—

NAME OF QUARRY.	SPECIFIC GRAVITY.	WEIGHT PER CUB. FOOT.	ABSORPTION OF WATER PER CENT.				
			1 second.	1 minute.	30 minutes.	1 day.	1 week.
			True.	Fair.	Dry.	Wet.	
Top, Fishponds	2.61	165.0	2.70	2.70	165.0	165.0	1.76
Grant's	2.57	162.4	2.67	2.67	162.4	162.4	1.76
Frenchay	2.59	167.3	2.67	2.67	167.3	167.3	1.76
Grimsall	2.58	167.3	2.67	2.67	167.3	167.3	1.76
Crisp Delf	2.58	167.3	2.67	2.67	167.3	167.3	1.76
Howley Park	2.58	167.3	2.67	2.67	167.3	167.3	1.76
Scotgate Ash (G)	2.58	167.3	2.67	2.67	167.3	167.3	1.76
Quarella (white)	2.58	167.3	2.67	2.67	167.3	167.3	1.76
Idle (G)	2.58	167.3	2.67	2.67	167.3	167.3	1.76
Darley Top	2.58	167.3	2.67	2.67	167.3	167.3	1.76

From the above table it will be seen that the Bristol "Blue Pennant" sandstone has a very high specific gravity and a correspondingly low ratio of absorption. That from the Top Quarry, Fish-

ponds, appears to be the least absorptive, though it is run very closely by the Ball's Quarry stone, and there is probably little to choose between them in this respect. It is quite clear that these are amongst the best building stones in the country for durability. The block from Idle experimented with is also not very absorptive, though from its rate of progression it would appear to be singularly retentive. The Howley Park stone behaved curiously; it was almost proof to immersions of minor duration, but in the course of a day took in as much as 4.50 per cent. The Quarella "white" also took some time to become thoroughly saturated. Of the stones dealt with, the "white" Grimsall was the most absorptive, taking in as much as 6.94 per cent. of its bulk, whilst it has, for a sandstone, a very low bulk, whilst it has, for a sandstone, a very low specific gravity (2.04). The Scotgate Ash stones occupy a median position with a percentage absorption of 3.91 and 5.04 respectively.

The student will find a general description of the building sandstones of Ireland in the *Builder* of March 26, 1892, p. 237.

In concluding this series it may not be out of place to state that we are quite aware of the existence of other quarries in England than those mentioned, but we have endeavoured to include all which appeared to be of more than local interest, and have paid especial attention to the limestones of the Jurassic period as yielding an enormous amount of stone used for the highest architectural purposes, which were for the most part comparatively unknown to architects prior to our investigations. We have not dealt with the sandstones at the same length, partly because they have been more fully described (at least, some of them) on previous occasions in this journal, and partly because our knowledge of their micro-structure is not so complete. In regard to the microscopic structure of the stones we have neither described nor illustrated any which were not cut from samples collected by ourselves at the various quarries visited, with the exception of the magnesian rocks of Mansfield and the Corsehill stone from Dumfries. The experiments on the physical properties of the stones were carried out entirely on specimens also obtained by ourselves on the spot, with the exception of three or four of the sandstones. Finally, we may say that during this lengthy and minute examination we have passed in review more than 350 slices of the stone under the microscope; and have attentively regarded more than 1,800 samples of stone.

#### GENERAL BUILDING NEWS.

KESWICK MORTUARY CHAPEL, NORFOLK.—The old church of All Saints, in this parish, which has been in ruins for upwards of 250 years, divine service having been last held there in 1602, and its remains, principally consisting of part of the round tower, almost surrounded by trees, is now undergoing a partial renovation for the purpose of being used as a mortuary chapel. The restoration will proceed as nearly as possible on the old lines, the principal works undertaken being thorough repair to the tower, including new roof, windows, &c., building new walls to the nave on the old foundations (which, even after a lapse of several centuries appear on examination to be sound) and covering the nave roof with tiles, &c. The iron railing enclosing the churchyard, which has now been re-opened for interments, was erected last year. The work to the new mortuary chapel has been entrusted to Mr. J. S. Smith, of Lakenham, Norwich, under the superintendence of Mr. Herbert J. Green, of Norwich, architect and Diocesan Surveyor.

RESTORATION OF ST. GERMAN'S, CORNWALL.—Messrs. Longbottom & Co., of Leeds, have been accepted to carry out the heating of St. Germans Church by their hot-air system, and Messrs. Lang & Son, of Liskeard, are the contractors for the restoration of the church according to designs prepared by Messrs. St. Aubyn, Wadling, & Luff, of London and Devonport.

CHURCH, LANRHILL, LANARKSHIRE.—On the 24th inst. the Church of St. Agnes, Lanhill, was opened. The church, of which the memorial-stone was laid on March 17, 1893, is of red sandstone, is in the Gothic style, and has been designed by Messrs. Pugin & Pugin, of London. It is 132 ft. long and 57 ft. broad, while the apex of the nave is 65 ft. in height, the chancel being 32 ft. deep. The total cost exceeds 6,000l., the church being seated for 950.

NEW BOARD SCHOOL AT MILES PLATTING.—The memorial stone of a new Board School, in Nelson-street, Miles Plating, was laid on the 16th inst. by Dr. Woodcock. The new school will accommodate 350 infants and 620 boys and girls in the mixed school, or a total of 1,070. The cost, including 1,254l. for site, is estimated at 12,000l. On the ground floor will be located the infants'

\* The *Builder*, Dec. 4, 1886, p. 286.

† Ibid., March, 1890, pp. 221, 277.

‡ The *Builder*, Dec. 11, 1886, pp. 361, 394.



school and lower standards, and on the upper floor the higher grades of scholars. On each floor there will be a central hall 112 ft. long and 28 ft. wide, surrounded by class-rooms. The contractors are Messrs. W. A. Peters & Sons, of Rochdale, and the work is being carried out from the designs and under the supervision of Messrs. Potts, Sons, & Pickup, architects, Manchester.

**WESLEYAN CHAPEL, WOODSIDE, YORKSHIRE.**—Six memorial-stones of a new Wesleyan Methodist Chapel, in process of erection at Woodside, Horsforth, were on the 23rd inst. The architects of the new building are Messrs. Fairbank & Wall, Bradford and Otley. The style adopted is a simple treatment of Gothic, with tower and spire. The chapel is to be 33 ft. by 50 ft., exclusive of transepts and choir. It will seat 315 people. There will be two vestries, an organ chamber, and a gallery to seat ninety. The heating is to be by hot water on the low-pressure system, while ventilation is to be obtained by means of patent air-pump ventilators. The cost of the whole structure is estimated at £1,850.

**POST OFFICE, BAKEWELL, DERBYSHIRE.**—A new post office has just been built at Bakewell. The principal office on the ground floor is approached from the square by a porch. The room is 20 ft. by 16 ft. Facing Bridge-street is the telegraph-room, and on the opposite side, facing the Town Hall, is the sorting-room, 35 ft. by 15 ft. At the rear of this is a workshop for the convenience of the line men and other workmen. On the first floor are the domestic rooms, kitchen, &c., for the use of the postmaster, and on the 3rd floor there are bedrooms, bath-room, lavatories, &c. The pavement is imitation marble mosaic work, supplied by Mr. J. Twigg, of Ashford. Mr. Thomas Allsopp was the contractor for the masonry, and Mr. C. F. Groom, of the Bakewell Saw Mills, for the joiners' work. Most of the other work, such as painting, plastering, plumbing, &c., has also been executed by local firms. The architect is Mr. E. M. Longsdon, Bakewell.

**CHRISTIAN MEETING-HOUSE AND SCHOOL, CARLISLE.**—The opening of the Christian Meeting House and School, situate at the corner of Edward-street and Grey-street, Carlisle, took place on the 24th inst. The building, which is two stories in height, has a schoolroom 40 ft. by 36 ft., two classrooms 12 ft. by 12 ft., scullery, heating-chamber, central and side-entrances, and lavatory accommodation on the ground-floor. The works have been carried out at a cost of about £1,600, by Messrs. Gordon & Logan (builders), J. H. Reed (joiner), G. Sowerby (plumber), C. J. Nanson (slater), S. Ferguson & Sons (plasterers), and R. Westray (painter). The architect is Mr. H. Higginson, of Carlisle.

**NEW WING, COOKRIDGE HOSPITAL, LEEDS.**—On the 18th inst. the Edward Jackson wing of the Cookridge Convalescent Hospital, Leeds, was opened. The new wing will provide accommodation for fifty additional patients, and will be largely devoted to the provision of additional sleeping accommodation. On the ground floor, in addition to two dormitories, there is the new men's day-room. The memorial wing is L-shaped, and the new dining-room forms one point of connexion between it and the original building, as access can be had to it at either end, and in future the men will enter it from the day-room and the women from the opposite end. A further connexion between the old and new buildings is afforded by a winter garden, covered with an ornamental glass roof, which is used as a recreation-room in inclement weather. Adjoining it are the smoke and billiard room and bath and dressing rooms. The recreation-room adjoins the dining-hall, with which it runs parallel, and at its eastern end is the door leading into the new wing. To the right, on entering the corridor, is the day-room, and to the left the boot-room and a lavatory. Continuing along the corridor, the staircase hall is reached, and to the right and left are dormitories, with twelve and eight beds respectively, which are repeated on the first and second floors above. The upper rooms are reached by a central hall staircase, which is open from floor to roof, and into which the whole of the dormitories can be ventilated. On the first floor, in addition to the two dormitories already mentioned, a third sleeping apartment has been provided, with accommodation for eleven beds. On each of the upper floors of the new wing there is a porter's room and lavatory. A new boiler, boiler-house, and chimney have been provided, and this boiler will be used to supply hot water for domestic uses and for the use of the hospital. The work has been carried out by Messrs. Thomas Green & Son, who have also rearranged the whole of the general heating apparatus. The whole of the other work has been executed by Messrs. Cross and Carter, contractors, of Leeds. The entire cost is estimated at over £4,000. Mr. Walter A. Hobson, of Leeds, was the architect.

**CATHOLIC CHURCH, COATBRIDGE.**—On the 14th inst. plans were passed at the Coatbridge Dean of Guild Court for the erection of a new Roman Catholic church. The plans are by Messrs. Pugin & Pugin, London. The cost is estimated at between £7,000 and £8,000.

**TEMPLE HOUSE, TEMPLE AVENUE.**—It is satisfactory to note, says the *Daily Graphic*, that the dreary waste which extends for some distance along the Embankment between the Temple Gardens and Blackfriars and the several roads in the immediate neighbourhood, is gradually becoming filled up. One of the latest additions is Temple House, in Temple Avenue, the new premises of Messrs. Horace Marshall & Son. The new building is designed in the Italian style, and is constructed of red brick and Portland stone. It occupies a corner site with 100 ft. frontage to Temple Avenue, and 30 ft. to Tallis-street. The basement and ground floor, containing an area of nearly 16,000 ft. sq., with hydraulic lift, will be devoted to the general requirements of the business as publishers and newspaper agents. The architect is Mr. Frederick Borcham, Finsbury-pavement; the builders are Patman & Fotheringham, Islington.

## SANITARY AND ENGINEERING NEWS.

**SEWAGE WORKS, STANLEY, YORKSHIRE.**—On the 19th inst. the first sod was cut of the outfall and sewage works, which are about to be constructed near Smalley Bight, Stanley. The site consists of about thirty-one acres of land. The work, which will entail a cost of about £17,000, has been let to three firms of contractors, Messrs. T. & G. Wilson, of Wakefield; Messrs. Garforth Brothers, Mirfield; and Mr. Simon Johnson, of Salford, Manchester. Mr. F. Massie, the engineer, gave a brief description of the proposed works, which have been devised by him and approved by the Local Government Board. He said that the drainage scheme for that portion of Stanley-cum-Wrenthorpe was comprised within the main drainage area of the river Calder. The township was a very large one, comprising 4,400 acres, and having a population of 12,214.

**A PRIVATE ELECTRIC INSTALLATION.**—The town residence of the Baroness and Mr. Burdett-Coutts at Stratton-street, W., after being entirely renovated, was re-opened at a reception given by the Baroness on the 26th inst. As an example of an old house fitted with the electric light and yet in no way modernised, nothing introduced to spoil the charm of the old-world associations, it is probable unique of its kind. The Baroness, who is very conservative in such matters, has preserved all the old candelabra, lamps, and candlesticks which have illumined the house for over a hundred years—gas never having been used—and adapted them to electric lighting. The effect is most charming. In the crystal candelabra, the main body of the light comes from the inside of the strings of lustres, giving a very sparkling effect. In the places where the candles used to be are placed small power lamps shaded by cut glass globes so as not to detract from the beauty of the hanging drops of light in the centre. The eye does not tire looking at the candelabra, for the light is so well diffused and softened that no dazzling effect is produced. Even in the drawing-room, where the illumination produced is high—there are about a hundred lamps—the eye is not in the least wearied. The principal sources of the illumination in the Picture Gallery are rows of lamps placed outside the circular ground glass windows in the ceiling. The effect is quite like daylight, and the pictures and statuary are seen to the best advantage. It also brings out the beauty of the carpets in this room. In the dining-room all the old oil-lamps and candlesticks have been converted into electric light fittings. The candlesticks have been fitted with candles surmounted by cut-glass shades in the form of upturned lilies, in which are placed ordinary lace shades, which have a tawdry effect. Several of the pictures in this room, one an excellent portrait of the Baroness by the late Edwin Long, R.A., are well lighted by electric lamps judiciously placed. We noticed in the hall that the large French lantern has been adapted for the electric light without in any way spoiling the beauty of the work done by the contractors, Messrs. Townsend & McIntyre. Messrs. Perry & Co., of Grafton-street, supplied the fittings and converted the candelabra.

## STAINED GLASS AND DECORATION.

**WINDOW, HOLY TRINITY CHURCH, SMITHWICK.**—A window has been inserted in the South Chapel as a memorial to the late Mr. Marshall, of Capethorn, the subject being the Anointing of our Lord. The window is from the studio of Mr. T. W. Camm, Smithwick.

**DECORATION OF CHURCH, WINDSOR.**—The Rector of Holy Trinity parish church, Windsor, the Rev. Arthur Robins, has had his church decorated from the designs of Messrs. Wyborn & Lee, in commemoration of the jubilee of the church. This is one of the few churches where the decorations have been carried throughout the entire building. The main portion of the work has been executed by Mr. E. Bamfylde, of Windsor, and the figures by Messrs. Campbell & Smith, of London.

## FOREIGN AND COLONIAL.

**FRANCE.**—After a visit to the two Salons the Conseil Supérieur des Beaux-Arts has awarded the "Prix de Paris" to M. Maxime Doumic, architect. It is the first time that the Prix du Salon (now called the "Prix de Paris") has been awarded to an architect. M. Doumic, who exhibited at the old Salon "Une Eglise de Pélerinage," a set of drawings which we specially noticed in our article on "Architecture at the Paris Salon," has already received a medal of the first class. The travelling studentship attached to the section of architecture has been awarded to M. Guimard, who exhibited at the Champ de Mars a monument designed for the cemetery at Baignolles. The Municipal Council of Paris has had under consideration a proposal for the transformation or reconstruction of the Palais de l'Industrie, which is notoriously in a very dilapidated state. There is even some idea of a competition for the erection of a new building. Several Paris journals announce (rightly or wrongly) that it is intended to establish a bridge over the Seine, opposite the Invalides, 100 metres wide, for the occasion of the 1900 Exhibition—a bridge which is to be lined on each side with houses, theatres, and monuments. The sub-committee concerned with the competition for the new buildings for the 1900 exhibition has met for the first time. It has in the first instance reported that the sum set aside for premiums should be raised from 50,000 to 100,000 francs. The architects are to take account, in laying out their plans, of the position occupied by the Eiffel Tower, the preservation of which has been decided on. The other buildings on the Champ de Mars are to be regarded as removable if desired. The monument to Barye was inaugurated last week, on the shady spot at the eastern extremity of the Ile St. Louis. The stone pedestal, the design of M. Bernier, is adorned with a medallion of Barye by M. Marqueste. It is surmounted by a group in bronze, "Theseus fighting with the Centaur," the original of which, executed by Barye, is at the Museum of Puy. To the right and left of the pedestal are two groups, also by Barye, "L'Ordre Punissant les Pervers," and "La Force Défendant le Travail," the originals of which are on two pavilions in the Cour de Carrousel. Between these two groups, and in front of the pedestal, is a reproduction of another celebrated work of Barye's, "The Lion Crushing a Serpent," the original of which is in the Tuileries Gardens. The combined effect of the whole, with its background of foliage, is very decorative. At the Grand Trianon at Versailles, the basin known as the "Plat-Font," or otherwise the "Pièce de Dragons," after being abandoned for a hundred years, has been reopened after a restoration by M. Marcel Lambert, architect, and M. Coustan, sculptor. The Fountain, designed by Jules Mansard and finished under Louis XV, is composed of superposed basins whence the water spouts among groups of children—two dragons also spout water into a lower basin, which has pedestals in rose marble, formerly carrying vases designed by Hardy and Poirier. The monument erected to Chapu at Mée (Seine-et-Marne) was inaugurated last Sunday.

**ITALY.**—Signor Capponi (architect) and Professo Gatti have, in the course of excavations undertaken by them, found reason to conclude that the great temple on the Monte San Angelo, above Terracina, formed part of the Roman temple to Jupiter on that spot, mentioned by Maurus Honoratus. Seneca, who flourished in the fourth century. Hitherto the ruins were supposed to be relics of the Palace of Theodorice, King of the Goths.

**RUSSIA.**—The Finance Minister is shortly expected in the province of Archangel on a tour of inspection of the various routes proposed for the railway from St. Petersburg to Archangel. At a recent meeting of the Moscow Archaeological Society M. Ewarsitzki lectured on the monumental buildings of Russian Central Asia, a land which should prove very prolific for the archaeologist. The lecturer laid special stress on the ruins of Afrosia, near Samarcand, measuring five versts in circumference, from which a number of terra-cotta articles have been obtained which show the influence of Greek art.

**GERMANY.**—The Christ Church at Moabit, a suburb of Berlin, has been consecrated in the presence of the Empress and several Cabinet Ministers. The State Prize of 1891, for sculptors has been won by Herr F. Klimesch, of Frankfurt-on-Maine; the architects' prize by Herr Karl Moritz, and the Schultze Prize of 1891, by Herr v. Woodside, both of Berlin. The latter, who is deaf and dumb, was placed first in the competition for the Emperor William monument at Laubau. New barracks, military offices, and drill-halls at a total cost of 65,000, are to be erected on the Tempelhof Field. There have now been 2,500 applicants for space for the 1895 exhibition, and the guarantee fund amounts to 125,000. Additional tracks are to be laid on the Götting and Circular Railways to cope with the increased traffic to be expected. Various important societies have passed resolutions in favour of reintroducing the Dortmund Rhine Canal Bill in the next session of the Prussian House. The telephone line from Berlin to Vienna will probably be handed over to the public use in the autumn. The



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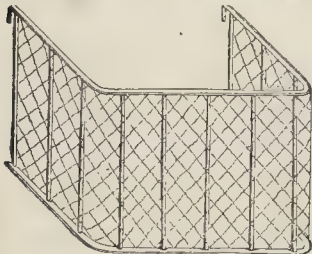
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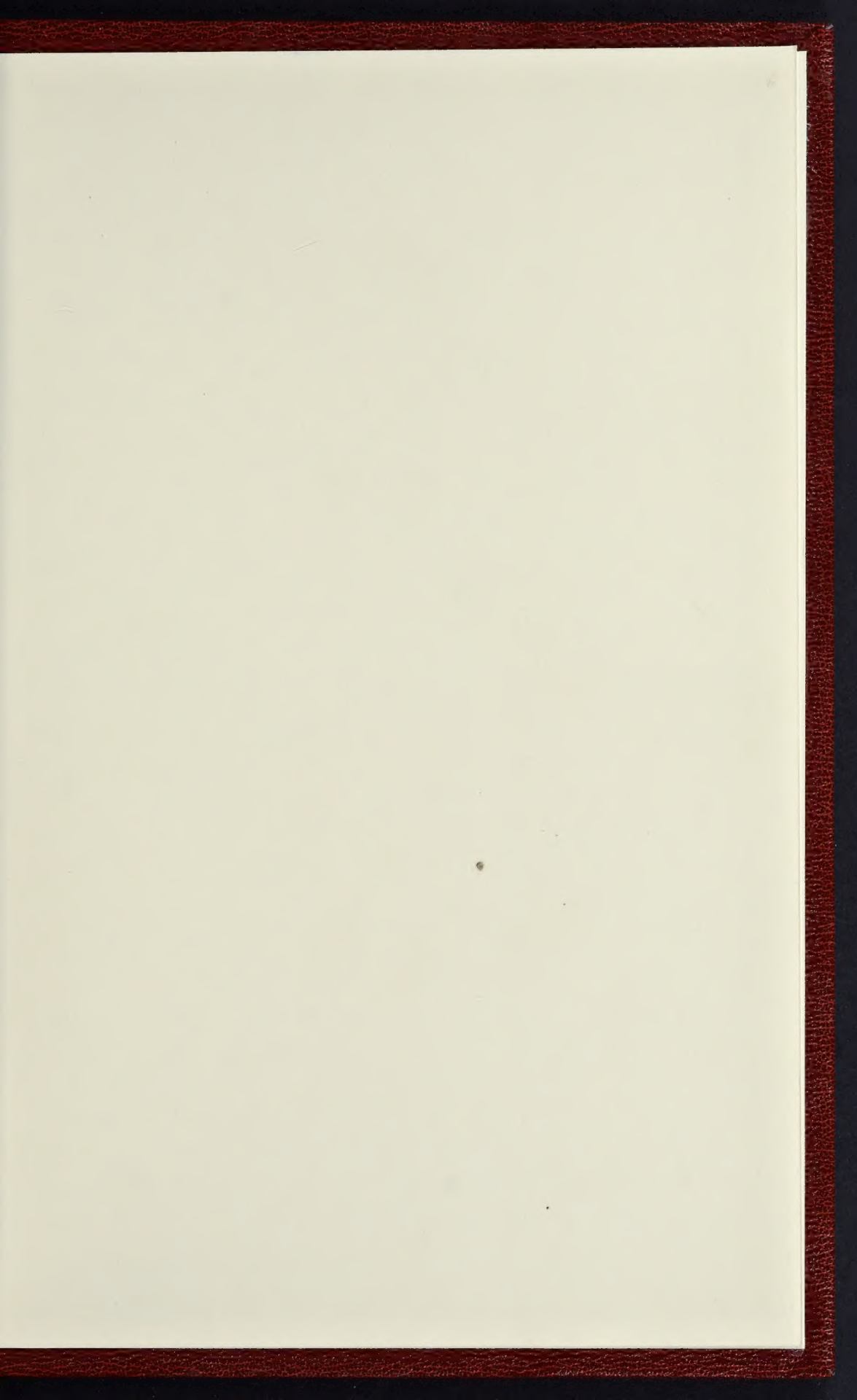
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